THE 14TH WORLD CONFERENCE ON TITANIUM

June 10-14, 2019 - Nantes, France

Final programme

Contact: info@titanium2019.com
SPONSORS ACKNOWLEDGEMENTS

The organising committee would like to thank the following companies for their support to Ti-2019 Conference.

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CONNECT TO CONFERECE WEBAPP

Stay tuned to follow information and updates and view the abstracts.

www.titanium2019.com
WELCOME WORD FROM TI-2019 CHAIR

The World Conference on Titanium (Ti-2019) is the fourteenth in a series of meetings that have been held every four years since 1968. The International Organizing Committee (IOC) representing the seven major titanium countries (UK, USA, CIS, Japan, Germany, China and France) has decided during the last edition in San Diego to entrust the organization of Ti-2019 to France. This is the second time, after Cannes in 1988, that France has the honor to organize this event which brings together the world’s titanium community to present and discuss progress in titanium science and technology. The city of Nantes along with La Cité Congress Centre are proud to welcome academic and industrial attendees coming from all over the world.

This event is jointly organized by The French Titanium Association and The French Society for Metallurgy and Materials with the help of the local EMC2 cluster and financial supports by industrial sponsors.

The scientific program includes a first plenary session which provides an overview of the advances in titanium research and development in the last four years. More specific topics will be addressed in nine parallel sessions with nearly 500 oral presentations. Two posters sessions in a friendly atmosphere will be also organized. Attendees are welcomed to visit the exhibition hall where industrial components are presented by our partners.

We are pleased to invite all the attendees at the welcome reception in the historic Caste of the Dukes of Brittany and to share a friendly gala dinner in The Machines of Nantes Isle.

We wish you a fruitful and pleasant conference in Nantes.

Patrick Villechaise
Chairman of the 14th World Conference on Titanium
COMMITTEES

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The Institute of Materials, Minerals and Mining, UK

Don Li  
The Minerals, Metals & Materials Society, USA

Vasisht Venkatesh  
ASM International, USA

Andrey Alexandrov  
Interstate Association “Titan”, CIS

Takayuki Narushima  
Japan Institute of Metals and Materials, Japan

Hui Chang  
The NonFerrous Metals Society of China, China

Carsten Siemers  
Deutsche Gesellschaft für Materialkunde e.V., Germany

Patrick Villechaise,  
Chairman of the Conference

The French Titanium Association & the French Society for Metallurgy and Materials, France

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Institut Pprime, Poitiers

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The French Society for Metallurgy and Materials, Paris

Jean Yves Hascoët  
The French Titanium Association, Nantes

Samuel Hémery  
Institut Pprime, Poitiers

Jean Luc Jacquot  
The French Society for Metallurgy and Materials, Paris

Laurent Manach  
EMC2, Nantes

Tugdual Bassi  
The French Titanium Association, Nantes

Sébastien de Villeroy  
EMC2, Nantes

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Elisabeth Gautier  
Institut Jean Lamour, Nancy

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Chimie ParisTech, Paris

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Centrale Nantes, Nantes

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Timet R&D, Ugine

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INSA Rennes, Rennes

Philippe Castany  
INSA Rennes, Rennes

Florence Pettinari-Sturmel  
CEMES, Toulouse

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CIRIMAT, Toulouse

Daniel Monceau  
CIRIMAT, Toulouse

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CIRIMAT, Toulouse

Patrick Villechaise  
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Institut Pprime, Poitiers

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2ForTiM, Saint-Germain-en-Laye

Michael Piellard  
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Jérôme Delfosse  
SAFRAN, Magny-les-Hameaux

Anne Denquin  
ONERA, Châtillon
THE FRENCH TITANIUM ASSOCIATION

The French Titanium Association was formed in 1994. It brings together French-speaking companies and laboratories with an interest in titanium and titanium alloys and their uses. The association relies on industrial and academic experts to brainstorm on new fields of applications and/or on proposals to improve the alloys and their micro-structures when specific limitations in use are encountered.

The association serves as a forum for discussion and collaboration with regard to the specific challenges of titanium and titanium alloys. Its work is structured largely around technical committees, set up to work on issues that are of interest to members of the association.

The French Titanium Association is keen to encourage wider circulation of technological information about the characteristics, special uses and procedures for titanium and its alloys. In addition, its members benefit from its active work to capitalize on the knowledge built up about this metal – the subject of a considerable amount of research in recent decades.

www.titane.asso.fr

FRENCH SOCIETY FOR METALLURGY AND MATERIALS (SF2M)

SF2M, the French Society for Metallurgy and Materials, was founded in 1945. It gathers nearly 1,000 members, from university and industry, and 15 partners which are industrial groups and federations. It brings together the scientific and professional community in the Metallurgy and Materials field in order to exchange and work together.

SF2M shares information on progress and technological innovation of the Metallurgy and Materials Science. It organizes technical and scientific meetings to optimize performance of its members, and brings awareness around material science and technology activities, especially among young people. SF2M represents its members in France and is a founding member of the Federation of European Materials Societies (FEMS).

www.sf2m.fr
POLE EMC2

The main organising bodies have designated the Pole EMC2 as operational support. EMC2 brings together a group of players around key markets and technologies. Their common objective is to reinforce the regional innovation and growth “ecosystem” in order to help French industry become more competitive with a focus on advanced manufacturing technologies as a shared cross-disciplinary feature.

EMC2 has the resource needed for the operational follow-up.

www.pole-emc2.fr

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TI-2019 CONFERENCE SECRETARIAT

Ti-2019 / MCI FRANCE
25 rue Anatole France - CS70139 - 92532 Levallois-Perret Cedex, France
Tel: +33 (0)1 53 85 82 80 - Fax: +33 (0)1 53 85 82 83

For general information: info@titanium2019.com
For exhibition, sponsorship and advertising sales: partnership@titanium2019.com
For registration and accommodation: registration@titanium2019.com
For abstracts: scientific@titanium2019.com
# SCHEDULE AT A GLANCE

**MONDAY, JUNE 10**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>16:00 - 19:00</td>
<td><em><strong>Opening of registration desk</strong></em>&lt;br&gt;Cité des Congrès, Nantes</td>
</tr>
<tr>
<td>18:30 - 20:00</td>
<td>***Welcome Reception</td>
</tr>
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**TUESDAY, JUNE 11**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>08:00 - 10:10</td>
<td>Plenary Session I</td>
</tr>
<tr>
<td>10:10 - 10:30</td>
<td>Coffee break in the exhibition area</td>
</tr>
<tr>
<td>10:30 - 12:10</td>
<td>Plenary Session II</td>
</tr>
<tr>
<td>12:10 - 13:30</td>
<td>Lunch in the exhibition area</td>
</tr>
<tr>
<td>13:30 - 15:30</td>
<td>Breakout sessions</td>
</tr>
<tr>
<td>15:30 - 15:50</td>
<td>Coffee break in the exhibition area</td>
</tr>
<tr>
<td>15:50 - 17:30</td>
<td>Breakout sessions</td>
</tr>
<tr>
<td>17:30 - 19:30</td>
<td>Posters visits</td>
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**WEDNESDAY, JUNE 12**

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<tr>
<td>08:00 - 10:00</td>
<td>Breakout sessions</td>
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<tr>
<td>10:00 - 10:20</td>
<td>Coffee break in the exhibition area</td>
</tr>
<tr>
<td>10:20 - 12:00</td>
<td>Breakout sessions</td>
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<tr>
<td>12:00 - 13:30</td>
<td>Lunch in the exhibition area</td>
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<tr>
<td>13:30 - 15:30</td>
<td>Breakout sessions</td>
</tr>
<tr>
<td>15:30 - 15:50</td>
<td>Coffee break in the exhibition area</td>
</tr>
<tr>
<td>15:50 - 17:30</td>
<td>Breakout sessions</td>
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<td>17:30 - 19:30</td>
<td>Posters visits</td>
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### THURSDAY, JUNE 13

<table>
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<tr>
<td>08:00 - 10:00</td>
<td>Breakout sessions</td>
</tr>
<tr>
<td>10:00 - 10:20</td>
<td>Coffee break in the exhibition area</td>
</tr>
<tr>
<td>10:20 - 12:00</td>
<td>Breakout sessions</td>
</tr>
<tr>
<td>12:00 - 13:30</td>
<td>Lunch in the exhibition area</td>
</tr>
<tr>
<td><strong>Afternoon</strong></td>
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<td></td>
<td>Industrial visits</td>
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<td></td>
<td>Upon registration on the website - limited number of seats</td>
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<tr>
<td></td>
<td>Networking in the exhibition &amp; Poster viewing</td>
</tr>
<tr>
<td>20:00 - 23:00</td>
<td>Gala Dinner</td>
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<td>Registration mandatory: 80 € per participant</td>
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### FRIDAY, JUNE 14

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<tr>
<td>08:00 - 10:00</td>
<td>Breakout sessions</td>
</tr>
<tr>
<td>10:00 - 10:20</td>
<td>Coffee break in the exhibition area</td>
</tr>
<tr>
<td>10:20 - 12:00</td>
<td>Breakout sessions</td>
</tr>
<tr>
<td>12:00 - 13:30</td>
<td>Lunch in the exhibition area</td>
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THE 14TH WORLD CONFERENCE ON TITANIUM

SCIENTIFIC PROGRAMME

TUESDAY 11TH JUNE 2019

08:00 - 10:10  PLENARY SESSION  Auditorium 800

- Introduction comments
- Titanium alloy research developments in the United Kingdom
  Martin Jackson (United Kingdom)
- Recent activities of titanium research and development in Japan
  Takayuki Narushima (Japan)
- Recent advances in titanium technology in the United States
  Don Li (United States)
- Developments in titanium research and applications in Germany
  Carsten Siemers (Germany)

10:10 – 10:30  Coffee break in the exhibition area

The A330neo shares many of the same innovations as the groundbreaking A350 XWB, delivering a 25% saving in fuel consumption compared to others in the category. Both aircraft also benefit from a common type rating, which means pilot training costs are significantly lower too. And on top of that, they can be fitted with our beautifully designed Airspace cabins, setting a new benchmark in passenger comfort and wellbeing.

Innovation. We make it fly.
10:30 - 12:10  PLENARY SESSION  Auditorium 800

- Current situation of titanium research, developments and applications in China  
  Hui Chang (China)
- New research and development of titanium production and application in the CIS  
  Andrey Alexandrov (Russian Federation)
- Titanium in France: research activities, industrial developments and applications  
  Pierre-François Louvigné (France)
- Concluding comments

12:10 - 13:30  Lunch in the exhibition area

Safran is a long-standing leader in the aircraft and space propulsion systems, aircraft equipment, and defense solutions. Beyond our commitment to delivering high-tech products, we strive for relationships with our customers and partners that are built on trust. As a result, our employees are empowered to innovate and to continuously push forward in sectors where technology holds the key to success.
# TUESDAY, JUNE 11TH | 13:30-15:50

## AUDITORIUM 800

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:30</td>
<td>T1-S1-1</td>
<td>Instruction of SLM used Ti6Al4V powders properties of supreme speed plasma rotating electrode process</td>
<td>Yang Liu*, Shu Jin Liang, Yun Jin Lai, Zhi Yu Han (China)</td>
</tr>
<tr>
<td>13:50</td>
<td>T1-S1-2</td>
<td>Effect of manufacturing process of master alloy powders on homogeneity of sintered Ti-5Al-1Fe by blended elemental powder metallurgy</td>
<td>Masashi Hayakawa*, Hideki Fujii, Matsuhide Horiwaka, Yosuke Inoue, Masahiro Morita (Japan)</td>
</tr>
<tr>
<td>14:10</td>
<td>T1-S1-3</td>
<td>Titanium powders spreadability assessments using rotating drum: what is the effect of recoater speed?</td>
<td>Naveen Mani Tripathi*, Olivier Rigo, Geoffrey Lumay, Filip Francqui (Belgium)</td>
</tr>
<tr>
<td>14:30</td>
<td>T1-S1-4</td>
<td>An experimental study of Ti-6AI-4V powder reactivity in gaseous environment: application to additive manufacturing</td>
<td>Mohamad Mahdi Siblani*, Maelig Olivier, Loic Favergeon (France)</td>
</tr>
<tr>
<td>14:50</td>
<td>T1-S1-5</td>
<td>Production technology of spherical titanium alloy powders used in 3D printing</td>
<td>Ma Teng*, Zhang Fei, Guo Zhengjiang (China)</td>
</tr>
<tr>
<td>15:10</td>
<td>T1-S1-6</td>
<td>Hydride approach in blended elemental powder metallurgy of beta titanium alloys</td>
<td>Dmytro Savvakin*, Orest Ivasishin, Denys Oryshych, Oleksandr Stasiuk, Li Yuanyuan (Ukraine)</td>
</tr>
<tr>
<td>15:30</td>
<td></td>
<td><strong>Coffee break in the exhibition area</strong></td>
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## AUDITORIUM 450

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<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Speaker(s)</th>
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<tbody>
<tr>
<td>13:30</td>
<td>T10-S1-1</td>
<td>The influence of ellipsoidal and cuboidal morphology omega phase on alpha phase precipitation in metastable beta titanium alloys</td>
<td>Yufeng Zheng, Rongpei Shi, Yunzhi Wang, Rajarshi Baranjee, Hamish Fraser* (United States)</td>
</tr>
<tr>
<td>13:50</td>
<td>T10-S1-2</td>
<td>Elastic constants of Ti-15Mo single crystals and their evolution with thermal treatment</td>
<td>Michaela Janovska*, Jitka Nejezchlebová, Petr Sedláč, Tomáš Grabec, Pavla Stoklasová, Jana Smilauerová, Miloš Janeček, Hanuš Seiner (Czech Republic)</td>
</tr>
<tr>
<td>14:10</td>
<td>T10-S1-3</td>
<td>The microstructure evolution of ω and α phase of β-CEZ Alloy</td>
<td>Tao He*, Yong Feng, Xianghong Liu, Wenzhong Luo, Kaixuan Wang (China)</td>
</tr>
<tr>
<td>14:30</td>
<td>T10-S1-4</td>
<td>Further research on hardenability of Ti-1023 β alloy using a sophisticated DoE Bohumil Prazak* (United Kingdom)</td>
<td></td>
</tr>
<tr>
<td>14:50</td>
<td>T10-S1-5</td>
<td>Exploration of nano-scale structural instabilities in metastable beta titanium alloys using advanced electron microscopy</td>
<td>Yufeng Zheng*, Qianglong Liang, Dong Wang, Yunzhi Wang, Rajarshi Baranjee, Dipankar Baranjee, Hamish Fraser (United States)</td>
</tr>
<tr>
<td>15:10</td>
<td>T10-S1-6</td>
<td>Phase transformations during continuous heating in a β-quenched Ti-5Al-3Mo-3V-2Cr-2Zr-1Nb-1Fe alloy</td>
<td>Cong Wu*, Yongqing Zhao, Qiaoyan Sun, Lian Zhou (China)</td>
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<tr>
<th>T9-S1</th>
<th>Microstructure properties relationships Deformation/α-β alloys I</th>
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</thead>
<tbody>
<tr>
<td>T9-S1-1</td>
<td>3D analysis of void development in an α/β titanium alloy by synchrotron X-ray microtomography</td>
</tr>
<tr>
<td>Hong Dong*, Yuehu Liu, Lingyu Liu, Eric Maitre, Jérôme Adrien, Sophie Cazottes, Wenlong Xiao, Chaoli Ma, Qiaoyan Sun, Nobuhiro Tsuji (China)</td>
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<thead>
<tr>
<th>T9-S1-2</th>
<th>Micro- and macro-scale deformation of bimodal structure in Ti-6Al-4V alloy</th>
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<tbody>
<tr>
<td>Yan Chong, Jangho Yi, Myeong-Hoem Park, Tilak Bhattacharjee, Yu Bai, Akinobu Shibata, Nobuhiro Tsuji* (Japan)</td>
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<tr>
<th>T9-S1-3</th>
<th>The effect of hard oriented macrzones on the slip activity in Ti-6Al-4V</th>
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<tbody>
<tr>
<td>David Lunt*, Zhenbo Zhang, Rhys Thomas, João Quinta Da Fonseca, Michael Preuss (United Kingdom)</td>
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<th>T9-S1-4</th>
<th>A comparative study on the substructure evolution and mechanical properties of TIME-TAL® 407 and Ti-64</th>
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<tr>
<td>Zachary Thomas Kloenne*, Gopal Viswanathan, Matthew Thomas, Michael Lorreto, Hamish Fraser (United States)</td>
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<tr>
<th>T9-S1-5</th>
<th>In-situ EBSD characterization of deformation behavior of primary alpha phase in Ti-6Al-4V</th>
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<tbody>
<tr>
<td>Wansong Li*, Shigeto Yamasaki, Masatoshi Mitsuhara, Hideharu Nakashima (Japan)</td>
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<tr>
<th>T9-S1-6</th>
<th>Deformation of low aluminium titanium alloys</th>
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<tr>
<td>Scott Sneddon*, Peifeng Li, Daniel Mulvihill, Mark Dixon (United Kingdom)</td>
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<tr>
<th>T9-S3</th>
<th>Microstructure properties relationships Ultrafine grains</th>
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<tr>
<td>T9-S3-1</td>
<td>Fabrication of ultrafine grained pure titanium with different Fe contents through thermomechanical process in α+β two-phase region</td>
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<tr>
<td>Yuan Zhang*, Yan Chong, Yu Bai, Guanyu Deng, Akinobu Shibata, Nobuhiro Tsuji (Japan)</td>
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<tr>
<th>T9-S3-2</th>
<th>Ultrafine grained metastable β-Ti alloy with high yield strength and ductility</th>
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<tr>
<td>Bingjie Zhang*, Yan Chong, Yu Bai, Dong Wang, Qiaoan Sun, Nobuhiro Tsuji, Yunzhi Wang (China)</td>
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<th>T9-S3-3</th>
<th>Ultrafine-grained titanium alloys based on amorphous crystallization</th>
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<tr>
<td>Chao Yang* (China)</td>
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<tr>
<th>T9-S3-4</th>
<th>Understanding the role of reinforcement content on microstructure and mechanical properties of ECAPed titanium matrix composites</th>
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<tbody>
<tr>
<td>Jianwen Li*, Yuanfei Han, Juan Xiang, Guangfa Huang, Weijie Li (China)</td>
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<tr>
<th>T9-S3-5</th>
<th>Thermal stability of titanium alloy VT8M-1 with ultrafine-grained structure</th>
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<tbody>
<tr>
<td>Andrej Stotskiy*, Alexander Polyakov, Grigory Dyakonov, Irina Semenova (Russian Federation)</td>
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<tr>
<th>T9-S3-6</th>
<th>Enhancement of superplasticity of the Ti-6Al-4V alloy via ultrafine grained heterogeneous microstructural control and metastable microstructural control</th>
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<tbody>
<tr>
<td>Hiroaki Matsumoto*, Vincent Velay, Vanessa Vidal (Japan)</td>
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### ROOM 150

<table>
<thead>
<tr>
<th>T9-S5</th>
<th>Microstructure properties relationships Texture / Microstructure analysis</th>
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<tbody>
<tr>
<td>T9-S5-1</td>
<td>An ex-situ method to separate primary and secondary α phases in the EBSD scan for bimodal two-phase (α+β) titanium alloy</td>
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<tr>
<td>Shibayan Ray*, Satyam Sivar (India)</td>
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<tr>
<th>T9-S5-2</th>
<th>Effect of the cross-sectional area reduction rate on the formation of &lt;001&gt;-fiber texture in Ti-5.5Mo-8Al-6Zr alloy wire</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yuri Shinohara*, Yoshihiko Matsumoto, Masaki Tabara, Hideki Hosoda, Tomonori Inamura (Japan)</td>
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<tr>
<th>T9-S5-3</th>
<th>Effect of thermomechanical processing on texture of Ti834 compressor disc alloy</th>
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<tbody>
<tr>
<td>Beatriz Fernandez Silva*, Bradley Wynne, Martin Jackson, Michael Bodie, Kate Fox (United Kingdom)</td>
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<tr>
<th>T9-S5-4</th>
<th>In-situ observation of the “fine-grained-strip tissue” of Ti6Al4V Φ500mm bar titanium alloys</th>
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<tr>
<td>Yushu Gu*, Xianghong Liu, Xiangyi Xue, Fengshou Zhang, Wensheng Wang, Enen Xu (China)</td>
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<tr>
<th>T9-S5-5</th>
<th>Effect of the morphology of lamellar α phase on ultrasonic attenuation in Ti 6Al 2Sn 4Zr-2Mo alloy</th>
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<tbody>
<tr>
<td>Haihong Guo*, Dong Liu, Junpeng Han, Zhanglei Zhao, Jiaqun Wang, Heiping Wang, Zhe Zhang (China)</td>
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<td>Room: I</td>
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<td>**T2-S1</td>
<td>**T3-S1</td>
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<td>Aerospace applications</td>
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<td>Alloy composition</td>
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### Tuesday, June 11th | 13:30-15:50

#### ROOM BC

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<tr>
<th>Time</th>
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</table>
| 13:30 | **T2-S1-1** Microstructure and mechanical characterisation of titanium alloy linear friction welds  
*Bertrand Filipo*, Kathryn Beamish, Bryan Humphreys, Martin Wood (United Kingdom) |
| 13:50 | **T2-S1-2** The development and application of hot isostatic pressing near net shape forming technology of titanium alloy powder  
*Xuhu Zhang*, Haiyang Zhang, Liang Wang, Guihua Xu, Junfeng Ding (China) |
| 14:00 | **T2-S1-3** Novel small scale method for assessing machinability of Ti-6Al-4V and Timetal 407  
*Christopher Dredge*, Ben Thomas, Rachid M’Saoubi, Martin Jackson (United Kingdom) |
| 14:10 | **T2-S1-4** Titanium sheet hot forming in the aerospace industry  
*Guillaume Sana* (France) |
| 14:30 | **T2-S1-5** Improvement of TA6V superficial mechanical properties through coatings preparation by plasma electrolytic oxidation  
*Marie Laveissière*, Hélène Cerda, Jérôme Roche, Laurent Arurault (France) |
| 14:50 | **T2-S1-6** Demonstration of the application of superplastic forming using infrared heating emitters to a part of structure including various geometrical singularities  
*Nicolas Fleurisson, Fabien Nazaret*, Else Lamic*, Jean-Pierre Bonnafé, Ludovic Ropars, Alexandre Collot (France) |
| 15:10 | **T3-S1-2** Development of α+β-type biomedical Ti-Nb alloys with high oxygen content  
*Kyosuke Ueda*, Masahito Omiya, Yusuke Hirose, Takayuki Narushima (Japan) |
| 15:30 | **T3-S1-3** Second-generation Titanium alloys Ti-15Mo and Ti-13Nb-13Zr: a comparison of the mechanical properties for implant applications  
*Carsten Siemers*, Florian Brunke, Joachim Roesler (Germany) |
| 15:50 | **T3-S1-4** Aluminum- and vanadium-free titanium alloys for medical applications  
*Fabian Haase*, Carsten Siemers, Lina Klinge, Cheng Lu, Patric Lang, Till König, Joachim Rösler (Germany) |

#### ROOM I

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<th>Time</th>
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</table>
| 13:30 | **T11-S1-1** Improvement of TA6V superficial properties through coatings preparation by plasma electrolytic oxidation  
*Marie Laveissière*, Hélène Cerda, Jérôme Roche, Laurent Arurault (France) |
| 13:50 | **T11-S1-2** Demonstration of the application of superplastic forming using infrared heating emitters to a part of structure including various geometrical singularities  
*Nicolas Fleurisson, Fabien Nazaret*, Else Lamic*, Jean-Pierre Bonnafé, Ludovic Ropars, Alexandre Collot (France) |
| 14:00 | **T11-S1-3** Ti and TiAl melting with a semi-inconel crucible  
Zimin Lu*, Jiao Luo, Miaoquan Li (China) |
| 14:10 | **T11-S1-4** Composite Ti-17 alloy with a lamellar (α+β) starting microstructure  
*Yamabe-Mitarai, Yoshio Itsumi* (Japan) |
| 14:30 | **T11-S1-5** Second-generation Titanium alloys Ti-15Mo and Ti-13Nb-13Zr: a comparison of the mechanical properties for implant applications  
*Carsten Siemers*, Florian Brunke, Joachim Roesler (Germany) |
| 14:50 | **T11-S1-6** Extra-high oxygen addition as a new strengthening strategy to overcome strength/ductility trade-off in fully biocompatible hexagonal titanium alloys  
*Régis Poullain*, Stéphanie Delannoy, Jean-Philippe Couzinié, Ivan Guillot, Emmanuel Clouet, Frédéric Prima (France) |
| 15:00 | **T8-S1-1** Electron beam melting of ingots of TiAl and NiTi alloys  
*Kui Liu*, Xiaobing Li, Ming Gao, Mengshu Zhang, Lei Shu, Bo Lh (China) |
| 15:10 | **T8-S1-2** Development of Ti-Nb alloys with high oxygen content  
*Masahito Omiya*, Yusuke Hirose, Takayuki Narushima (Japan) |
| 15:30 | **T8-S1-3** Second-generation Titanium alloys Ti-15Mo and Ti-13Nb-13Zr: a comparison of the mechanical properties for implant applications  
*Carsten Siemers*, Florian Brunke, Joachim Roesler (Germany) |
| 15:50 | **T8-S1-4** Aluminum- and vanadium-free titanium alloys for medical applications  
*Fabian Haase*, Carsten Siemers, Lina Klinge, Cheng Lu, Patric Lang, Till König, Joachim Rösler (Germany) |

### Coffee break in the exhibition area
### ROOM G

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<th>T11-S1-1</th>
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</table>
| Effect of processing parameters on α-lath thickness of TC17 alloy during deformation in the β phase region and subsequent heating treatment  
Zimin Lu*, Jiao Luo, Miaoquan Li (China) |

| T11-S1-2 | Macro-mesoscale microstructural evolution modeling under hot forging of a Ti-17 alloy with a lamellar (α+β) starting microstructure  
Hiroaki Matsumoto*, Kenta Yamanaka, Akihiko Chiba, Yoko Yamabe-Mitarai, Yoshi Isumi (Japan) |

| T11-S1-3 | Phase transformation and evolution of dislocation structure in the β phase of Ti-17 alloy during hot deformation  
Kenta Yamanaka*, Manami Mori, Hiroaki Matsumoto, Akihiko Chiba (Japan) |

| T11-S1-4 | Development of a new set of constitutive equations for titanium matrix composite at hot working conditions  
Lihua Du*, Jun Jiang, Zhusheng Shi, Weijie Lu (China) |

| T11-S1-5 | The process of manufacturing and evaluation of near-net shaped titanium extrusions  
Phani P Gudipati*, Michael Campbell, Joshua Phillips, David Crouch (United States) |

### ROOM H

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<th>T8-S1-1</th>
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| Cost effectively vacuum induction melting of TiAl and NiTi alloys  
Kai Liu*, Xiaobing Li, Ming Gao, Mengshu Zhang, Lei Shu, Bo Chen (China) |

| T8-S1-2 | Electron-beam melting of ingots of TiAl system intermetallics  
Serhii Akhonin*, Volodymyr Berezos, Andrii Severny (Ukraine) |

| T8-S1-3 | Ti and TiAl melting with a semi-industrial PAMCHR  
FABIENNE RUBY-MEYER*, EMILIANE DORIDOT, JÉRÔME DELFOSSE, STÉPHANE HANS (FRANCE) |

| T8-S1-4 | Characterization of the thermal flux transferred by the plasma arc to the surface of the liquid bath in the Plasma Arc Melting Cold Hearth Refining process (PAMCHR)  
Léa Décultot*, Alain Jardy, Stéphane Hans, Emiliane Doridot, Jérôme Delfosse, Fabienne Ruby-Meyer, Jean-Pierre Bellot (France) |

| T8-S1-5 | Dissolution behavior of a titanium nitride sponge in titanium alloy melt  
Hideo Mizukami*, Tomoyuki Kitaura, Yoshihisa Shirai (Japan) |

| T8-S1-6 | Electron beam melting toward defects-free titanium alloys  
Hitoshi Funagane*, Yoshinari Takeda, Masaaki Wada, Hideo Mizukami, Shigeru Umida (Japan) |

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**Keynote lecture**

Advances and Breakthroughs in Titanium forgings for critical structural parts  
Jacques Lecadet (France)

Coffee break in the exhibition area
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<td>Additive and near netshape manufacturing</td>
<td>Microstructure evolution / β alloys II</td>
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<td>16:10</td>
<td>Powders and Process II</td>
<td>Phase transformation / β alloys II</td>
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<tr>
<td>16:10</td>
<td>The uses and applications of hydrogen processing for titanium additive manufacturing</td>
<td>Microstructure and texture characteristics of a new metastable β titanium alloy</td>
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<tr>
<td>16:30</td>
<td>Machine Learning for competitive grain growth behavior in additive manufacturing</td>
<td>The influence of the ultra-fine grained structure on phase transformations in Ti15Mo alloy</td>
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<tr>
<td>16:30</td>
<td>In-situ investigation and simulation of the grain-refinement mechanisms in Ti-6Al-4V components built using the rolling-integrated WAAM process</td>
<td>Study of harmonic microstructure development during Spark Plasma Sintering of β-CEZ titanium alloy</td>
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<td>16:30</td>
<td>Hybrid manufacturing (HYAM) for refined DLD’d Ti-6Al-4V microstructure</td>
<td>Decomposition of the β phase at intermediate temperature in β-metastable Ti-5553 alloy</td>
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<td>16:50</td>
<td>An overview of cold spray additive technology in australia to melt-less manufacture titanium</td>
<td>Phase transformation in metastable Ti alloy investigated by neutron diffraction</td>
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<td>17:10</td>
<td>Plastic deformation of beta-Ti-Mo alloys with isothermal omega phase</td>
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<tr>
<td>17:30</td>
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<td>Posters visits</td>
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</table>
T9-S2-1 3D characterization of microtexture in Ti64
Joseph Wendorf*, Jean-Charles Stinville, Andrew Polonsky, Mclean Echlin, Tresa Pollock (United States)

T9-S2-2 Role of interface in the plasticity of Ti-6Al-4V
Zhaoan Liu*, Royan Ameen, Zhaoxuan Wu, Ian Jones, Yu Lung Chiu (United Kingdom)

T9-S2-3 A 3D crystal plasticity modelling of cyclic deformation for a commercial purity polycrystalline Ti with harmonic structure
Li Jia, Wang Xiang*, Guy Dirras, Fabien Cazes, Azziz Hocini (France)

T9-S2-4 Slip transmission in titanium alloys by synchrotron in situ topotomography and high-resolution digital image correlation
P.C. Callahan, Jean-Charles Stinville*, W. Ludwig, L.H. Proudhon, T.M. Pollock (United States)

T9-S2-5 Multi-strengthening mechanisms in a novel titanium alloy with (TiHf)5Si3 particle-reinforcement
Yan Du* (China)

T9-S2-6 Experimental study of the superplastic and hot deformation mechanisms of a Ti-6Al-2Sn-4Zr-2Mo Titanium Alloy
Gen Yamane, Felantsoo Avotrintaina, Simon Menard, Vanessa Vidal*, Hiroaki Matsumoto, Vincent Velay (Japan)

T9-S4-1 Mechanical behaviour and microstructural evolution in fine grain Ti-6Al-4V alloy under superplastic conditions
Laurie Despax*, Vanessa Vidal, Denis Delagnes, Moukrane Dehmas, Hiroaki Matsumoto, Vincent Velay (France)

T9-S4-2 Vacuum superplastic deformation behavior of a near-alpha titanium alloy TA32
Chao Cheng*, Weitian Zhang, Zhiyong Chen, Liang Jin, Qingjiang Wang (China)

T9-S4-3 Enhanced superplasticity of ultra-fine grained Ti-6Al-4V alloy processed by step-rolling
Geonhyeong Kim*, Yongmoon Lee, Seongwoo Choi, Jaekeun Hong, Chongsoo Lee (Republic of Korea)

T9-S4-4 Superplastic parts manufacturing by Infrared emitters: series forming application with thermal regulation
Elise Lamic*, Damien Mauduit, Fabien Nazaret, Rémi Giblas, Thomas Pottier, Thierry Cutard (France)

T9-S4-5 Experimental study of the superplastic and hot deformation mechanisms of a Ti-6Al-2Sn-4Zr-2Mo Titanium Alloy
Gen Yamane, Felantsoo Avotrintaina, Simon Menard, Vanessa Vidal*, Hiroaki Matsumoto, Vincent Velay (Japan)

T9-S6-1 Orientation mapping of cp-Ti by reflected polarized light microscopy
Lucia Morales-Rivas*, Luisa Böhme, Eberhard Kerscher (Germany)

T9-S6-2 Spatial resolved acoustic spectroscopy to obtain texture and orientation
Thomas Ales, Matthew Kenney, Maria Quintana, Lucas Koester, Matt Clark, Wenqi Li, Steve Sharples, Peter Collins* (United States)

T9-S6-3 Thermal stability of nanostructure layer on the surface of Ti-5Al-2Sn-2Zr-4Mo-4Cr Titanium alloy
Min Wang, Yong Zhang*, Hao Yu, Yongquan Ning, Hongzhen Gua, Zekun Yao (China)
### TUESDAY, JUNE 11TH | 15:50 - 19:30

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<td>Aerospace applications**&lt;br&gt;Process II</td>
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<td><strong>T2-S2-1</strong> Superplastic Behaviour of Ti54M and Ti64&lt;br&gt;Paranjayee Mandal*, Ares Gomez-Gallegos, Diego Gonzalez, Hasam Elrakayby, Paul Blackwell (United Kingdom)</td>
<td><strong>T3-S2-1</strong> Ultrafine-grained Ti-13Nb-13Zr alloy for dental implant applications&lt;br&gt;Carsten Siemers*, Fabian Haase, Florian Brunke, Johannes Scherer (Germany)</td>
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<td><strong>T2-S2-2</strong> Development of numerical tool for hybrid manufacturing process for titanium sheet metal forming&lt;br&gt;Mohamed Achouri* (France)</td>
<td><strong>T3-S2-2</strong> Cannulated bar technology for the orthopaedics: application and processing&lt;br&gt;Francois Ory*, Jean-Luc Fraysse (France)</td>
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<td><strong>T2-S2-3</strong> Mechanical properties, microstructural characterization and dimensional integrity of titanium extrusions&lt;br&gt;Phani P Gudipati*, David Crouch (United States)</td>
<td><strong>T3-S2-3</strong> Titanium alloys application on medical devices to improve recharging performance&lt;br&gt;Bernard Li* (United States)</td>
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<td><strong>T2-S2-4</strong> Effect of edge condition on the sheet formability of commercially pure titanium (CP-Ti Grade 2) at room temperature&lt;br&gt;James Sefakor Kwame*, Evgenia Yakushina, Paul Blackwell (United Kingdom)</td>
<td><strong>T3-S2-4</strong> Numerical modeling analysis of a hip prosthesis mechanical behavior using the finite element methods&lt;br&gt;Brahim Necib*, Ali Benhaoua (Algeria)</td>
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<td><strong>T2-S2-5</strong> Finite element analysis of expansion force for TiNiFe shape memory pipe coupling&lt;br&gt;Huibo Zhang*, Wei Jin (China)</td>
<td><strong>Keynote lecture</strong>&lt;br&gt;Recent studies and developments concerning Titanium biomaterials&lt;br&gt;Masahiko Ikeda (Japan)</td>
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1. **T2-S2-1** Superplastic Behaviour of Ti54M and Ti64<br>Paranjayee Mandal*, Ares Gomez-Gallegos, Diego Gonzalez, Hasam Elrakayby, Paul Blackwell (United Kingdom)
2. **T2-S2-2** Development of numerical tool for hybrid manufacturing process for titanium sheet metal forming<br>Mohamed Achouri* (France)
3. **T2-S2-3** Mechanical properties, microstructural characterization and dimensional integrity of titanium extrusions<br>Phani P Gudipati*, David Crouch (United States)
4. **T2-S2-4** Effect of edge condition on the sheet formability of commercially pure titanium (CP-Ti Grade 2) at room temperature<br>James Sefakor Kwame*, Evgenia Yakushina, Paul Blackwell (United Kingdom)
5. **T2-S2-5** Finite element analysis of expansion force for TiNiFe shape memory pipe coupling<br>Huibo Zhang*, Wei Jin (China)
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<td>Mechanical</td>
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<td>properties I</td>
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**Keynote lecture**
Progress in wrought processing of Titanium
Mikhail O. Leder (Russian Federation)

**T11-S2-4** Analysis of the formation reason of low-power delamination microstructure of BT22 titanium alloy forgings
Lin Lin Cui*, Liu Kaikai (China)

**T11-S2-5** Diffusion bonding of dissimilar TiAl/Ti-17 alloys at a low temperature
Hong Li*, Chao Yang, Miaoquan Li (China)

**T8-S2-1** Effect of crystallizer's three-dimension on the solid-liquid interface morphology of the large-scale TC4 during EBCHM
Qianli Liu* (China)

**T8-S2-2** Importance analysis of master alloys in titanium produced by two-step method for product quality
Qiang Lei*, Tao He, Yanjie Fan, Wenzhong Luo, Feng Xiao, Xianghong Liu (China)

**T8-S2-3** Reactions of alkaline earth zirconate refractories with titanium alloys
Stefan Schoffoener* (United States)

**T8-S2-4** Revisited: gas-saturated defects in titanium alloys
Maria Kornilova*, Mikhail Leder, Igor Puzakov, Nataliya Tarenkova, Kirill Rusakov (Russian Federation)

**T8-S2-5** Aerospace titanium alloy melt process quality improvements
Andy Woodfield*, Gerard Lemaître (United States)

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Posters visits
## WEDNESDAY, JUNE 12\textsuperscript{TH}  |  08:00-10:20

### AUDITORIUM 800

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<th>Time</th>
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| 08:00    | **T1-S3-1** On the advances to obtain excellent and repeatable mechanical properties and build quality of LaserForm\textsuperscript{®} Ti gr23 (A) across whole build platform  
Gokula Krishna Muralidharan*, Anthony Beckers, Karel Lietoert, Pierre Van Cauwenbergh, Lore Thijs, Jonas Van Vaerenbergh (Belgium) |
| 08:20    | **T1-S3-2** On the possibilities of printing LaserForm\textsuperscript{®} Ti grade 23(A) at improved productivity without compromise on the build quality  
Gokula Krishna Muralidharan*, Karel Lietoert, Pierre Van Cauwenbergh, Karl Jorissen, Kirill Volchek, Lore Thijs (Belgium) |
| 08:40    | **T1-S3-3** Process variation in selective laser melting Ti-6Al-4V alloy  
Zhuoer Chen*, Xinhua Wu, Chris Davies (Australia) |
| 09:00    | **T1-S3-4** Consideration of additive manufacturing supports on TA6V SLM structure for finish milling  
Paul Didier*, Gaël Le Coz, Boris Piotrowski, Guillaume Robin, Abdelhadi Moufki, Pascal Laheurte (France) |
| 09:20    | **T1-S3-5** Numerical simulation of Prodways Rapid Additive Forging (RAF) additive process  
Lionel Depradeux, Gilles Duval, Corentin Robitaille* (France) |
| 09:40    | **T1-S3-6** Recycling of titanium swarf into wire using the Conform extrusion process  
Sarah Anne Smythe*, Ben Thomas, Daniel Suarez-Fernandez, Xin Fang, Benoit Marguet, Martin Jackson (United Kingdom) |

### AUDITORIUM 450

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<th>Time</th>
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| 08:00    | **T10-S3-1** Phase transformations in β-titanium alloys studied by electrical resistance measurement  
Petr Harcuba*, Jana Šmilauerová, Pavel Zháňal, Michal Hájek, Miloš Janeček (Czech Republic) |
| 08:20    | **T10-S3-2** Thermo-kinetic modeling for the growth/dissolution of equiaxed and lamellar α in Ti-55531 under continuous heating condition  
Fuwenn Chen*, Guanglong Xu, Kechao Zhou, Hui Chang (China) |
| 08:40    | **T10-S3-3** Evolution of alpha phase in metastable beta titanium alloys studied by small-angle X-ray scattering  
Jana Šmilauerová*, Václav Holý, Petr Harcuba, Miloš Janeček, Josef Strásky, Jitka Stráská, Jan Ilavský (Czech Republic) |
| 09:00    | **T10-S3-4** Hierarchical criteria to promote fast and selective αGB precipitation at β grain boundaries in β metastable Ti-alloys  
Tao Liu, Lionel Germain, Julien Teixeira, Elisabeth Aebi-Gautier*, Nathalie Gey (France) |
| 09:20    | **T10-S3-5** Control technique of globularization of the lamellar alpha in Ti-17 alloy and its effect on mechanical properties  
Jianwei Xu* (China) |
| 09:40    | **T10-S3-6** Ti-15Mo alloy prepared by cryogenic milling and spark plasma sintering  
Anna Terynková*, Jiří Kozlík, Kristína Bartha, Tomáš Chráska, Josef Strásky (Czech Republic) |

**Coffee break in the exhibition area**
**ROOM 300**

- **T9-S7** | Microstructure properties relationships
  Fatigue

  - **T9-S7-1** Forecast of the fatigue crack initiation site in cp-Ti miniature specimens with local surface topography data
    Luisa Böhm*, Felix Stroer, Jörg Seewig, Eberhard Kerscher (Germany)

- **T9-S7-2** Microstructural Evolution and Fatigue Properties of the Novel Titanium Alloy Timetal® 407
  William Davey*, Martin Boche, Matthew Thomas, Iain Berment-Parr (United Kingdom)

- **T9-S7-3** Fatigue performance of surface nanocrystallized TC4
  Zhong Conghui* (China)

- **T9-S7-4** Dislocation interactions in near-alpha Titanium alloy Ti6242Si under LCF
  Sudha Joseph*, Trevor C Lindley, David Dye (United Kingdom)

- **T9-S7-5** Advanced titanium alloy fatigue modeling
  Michael Glavicic*, Vasishth Venkatesh, Kayla Colvert, Thomas Broderick, Sesh Tamirisakandala, Ian Dempster, Vikas Saraf, Fatmata Barrie, Daira Legzdina, Wiliam Musinski, Paul Shade, Ravi Shankar, Ayman Salem (United States)

- **T9-S7-6** Microstructure effect on fatigue stability and deformation heterogeneities in fatigue damage failures in a near β titanium alloy Ti7333
  Zhihong Wu*, Hongchao Kou, Wei Chen, Ying Deng, Bin Tang, Jinshan Li (China)

**ROOM 200**

- **T9-S11** | Microstructure properties relationships
  TRIP / TWIP I

  - **T9-S11-3** Deformation and fracture behavior of new strain-transformable titanium alloys: a multi-scale investigation
    Chloé Varenne*, Frédéric Prima, Jacques Besson, Cédrik Braze, Julie Bourgon, Anne-Françoise Gourgues-Lorenzon (France)

- **T9-S11-4** Design and development of a dual-phase TRIP-TWIP alloy for enhanced mechanical properties
  Lola Liensten*, Yolaine Danard, Fan Sun, Philippe Vermaut, Loïc Perrière, Jean-Marc Joubert, Frédéric Prima (Germany)

- **T9-S11-5** Novel insights into the phase transformation and deformation mode of metastable beta titanium alloys
  Xiaohua Min* (China)

- **T9-S11-6** TRIP titanium alloy design
  Fan Meng*, Gregory Olson (United States)

**ROOM 150**

- **T9-S15** | Microstructure properties relationships
  α-β alloys I

  - **T9-S15-1** Transformations, recrystallization, microtexture and plasticity in titanium alloys; an emerging view
    Dipankar Banerjee* (India)

- **T9-S15-2** Extremely rapid age hardening behavior in solution treated Ti-5Al-2Fe-3Mo
  Tomonori Kunieda*, Hideki Fujii, Kazuhiro Tokahashi (Japan)

- **T9-S15-3** Alloying elements partitioning behaviors in α+β titanium alloy: the mechanism and application
  Yingjie Ma*, Senan Huang, Qi Xun, Cong Wang, Jianke Qiu, Jiafeng Lei, Rui Yang (China)

- **T9-S15-4** Electron beam cold hearth melted titanium alloys and the possibility of their use as anti-ballistic materials
  Pavlo Markovsky*, Serhii Akhonin, Volodymyr Berezos, Vadim Bondarchuk (Ukraine)

- **T9-S15-5** Predicting the tensile properties of additively manufactured Ti-6Al-4V via electron beam deposition
  Thomas Ales, Iman Ghamarian, Brian Hayes, Brian Welk, Andrew Baker, Matthew Kenney, D Gary Harlow, Hamish Fraser, Peter Collins* (United States)

- **T9-S15-6** Ti-6Al-2Sn-2Zr-2Mo-2Cr alloy for high strength aerospace fasteners
  Sesh A Tamirisakandala*, Manish Kamal (United States)

Coffee break in the exhibition area
WEDNESDAY, JUNE 12TH | 08:00-10:20

**ROOM BC**

**T2-S3 | Aerospace applications**  
**Welding / Process III**

**08:00**  
**T2-S3-1** The Bonding of Additive Manufactured Ti-6Al-4V via the Powder Interlayer Bonding (PIB) Process  
*Peter Davies*, Helen Davies, Silvia Marchisio (United Kingdom)

**08:20**  
**T2-S3-2** Linear friction welding: process control and machine technology  
*Yasmine Sadallah*, Nicolas Piolle (France)

**08:40**  
**T2-S3-3** The orbital friction welding process for engines components in aeronautic  
*Jérémy Escaffre*, Yann Lefaux, Astrid Lenain (Belgium)

**09:00**  
**T2-S3-4** Thermal relaxation of residual stresses in Ti-6-4  
*Aleksandar Stanojevic*, Bernd Oberwinkler, Martin Leitner (Austria)

**09:20**  
**T2-S3-6** Failure Investigation as a route to improving integrity of titanium alloys in service  
*Chris Collins*, Felicity Dear, David Dye, David Rugg (United Kingdom)

**09:40**  
**T3-S3 | Biomedical and Healthcare Applications**  
**Deformation I**

**08:00**  
**T3-S3-1** Influences of Mo addition on mechanical properties and deformation behavior of β-type Ti alloys  
*Ken Cho*, Ryota Morioka, Hiroyuki Y. Yasuda (Japan)

**08:20**  
**T3-S3-2** Control of crystallographic orientation by metal additive manufacturing process of β-type Ti alloys based on the bone tissue anisotropy  
*Takayoshi Nakano*, Takuya Ishimoto, Airo Matsugaki, Ryosuke Ozasa (Japan)

**08:40**  
**T3-S3-3** Controlling of mechanical property in additive manufactured porous titanium by structural control and alloying for bone substitutes  
*Masato Ueda*, Masahiko Ikeda (Japan)

**09:00**  
**T3-S3-4** Study of superelastic performance on novel (Ti-Zr)-based alloy via electron back-scattered diffraction, in situ synchrotron x-ray diffraction and transmission electron microscopy  
Jingjun Gao*, Philippe Castany, Denis Laille, Isabelle Thibon, Thierry Gloriant (France)

**09:20**  
**T3-S3-5** Effect of thermo-mechanical treatment on microstructure and mechanical properties of two-phase TiNbO alloy  
*Wang Junshuai*, Ma Chaoli, Xiao Wenlong (China)

**09:40**  
**T3-S3-6** Achieving high strength and low Young’s modulus by controlling the beta stabilizers content in Ti-Nb- (Ta)- (Zr)-O alloys  
*Dalibor Preisler*, Josef Strasky, Petr Harcuba, Milos Janecek (Czech Republic)

**10:00**  
**Coffee break in the exhibition area**
### T7-S1 | Marine, Gas and Other Industrial Applications Session I

**T7-S1-3** Hydrogen absorption and hydride formation in pure titanium T40 (grade 2) and TA6V ELI (grade 23) under cathodic polarization in artificial seawater  
*Alexandre Poloni*, Juan Creus, Abdelali Oudriss, Cyril Berziou, Egle Conforto, Simon Frappart, Thierry Millot, Aude Mathis, Xavier Feaugas (France)  

**T7-S1-2** Impact of hydrogen on the behavior of titanium alloys welded tubes  
*Elise Deloye, La Chance Lepemangoye*, Nicolas Creton, Tony Montesin (France)  

**T7-S1-1** Influence of hydrogen on mechanical properties of pure titanium T40 (grade 2) and TA6V ELI (grade 23): a local approach of fracture  
*Alexandre Poloni, Abdelali Oudriss*, Juan Creus, Stéphane Cohendoz, Jamaa Bouhattate, Simon Frappart, Thierry Millot, Aude Mathis, Xavier Feaugas (France)  

### Keynote lecture

**Titanium in shipbuilding and other technical applications**  
*Pavel Kuznetcov (Russian Federation)*

### T8-S3 | Melting and Casting Casting I

**T8-S3-2** Alternative methods for alpha case reduction  
*Farzin Fatollahi-Fard* (United States)  

**T8-S3-4** Industrial applications of modelling tools to simulate the PAMCHR casting and VAR process for Ti64  
*Emiliane Doridot*, Stéphane Hans, Alain Jardy, Jean-Pierre Bellot (France)  

**T8-S3-5** Titanium alloy design and casting process development using an integrated computational materials engineering (ICME) approach  
*Zhi Liang, Jiashi Miao, Anil Sachdev, James Williams, Alan A Luo* (United States)  

**T8-S3-6** Numerical simulation of the ingot growth during the Vacuum Arc Remelting (VAR) process  
*Sergejs Spitans*, Henrik Franz, Harald Scholz, Georg Reiter, Cogent Baake (Germany)  

**Coffee break in the exhibition area**
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<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
<th>Details</th>
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<tbody>
<tr>
<td>10:20</td>
<td>T1-S4-1 The forging response and structural integrity of Ti-6Al-4V and Ti-6Al-2Sn-4Zr-2Mo powders joined by FAST-DB</td>
<td>AUDITORIUM 800</td>
<td>Oliver Levano*, Nick Weston, Jacob Pope, Gavin Baxter, Martin Jackson (United Kingdom)</td>
</tr>
<tr>
<td>10:40</td>
<td>T1-S4-2 Influence of wire arc additive manufacturing of Ti-64 on microstructure and mechanical properties for potential large scale aviation parts</td>
<td>AUDITORIUM 800</td>
<td>Daniel Elitzer*, Heinz Werner Höppel, Math (Germany)</td>
</tr>
<tr>
<td>11:00</td>
<td>T1-S4-3 Additive Manufacturing of Metastable β-Ti alloys via Laser Engineered Net Shaping (LENS)</td>
<td>AUDITORIUM 800</td>
<td>Srinivas Aditya Mantri*, James Williams, Eugene Ivanov, Rajarshi Banerjee (United States)</td>
</tr>
<tr>
<td>11:20</td>
<td>Keynote lecture Innovative aerospace and space structures made by additive manufacturing of Titanium alloys and Titanium aluminides</td>
<td>AUDITORIUM 800</td>
<td>Christoph Leyens (Germany)</td>
</tr>
<tr>
<td>11:40</td>
<td>T10-S4-1 Effect of adiabatic heating on microstructure evolution in Ti-6Al-4V during high strain rate forging</td>
<td>AUDITORIUM 450</td>
<td>Mykola Kulakov*, Laurie Da Silva, Aurik Andreu (United Kingdom)</td>
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<tr>
<td>11:40</td>
<td>T10-S4-2 The difference between hot and cold deformation and its effect on microstructure and mechanical properties of near beta titanium alloy</td>
<td>AUDITORIUM 450</td>
<td>Alexander Sergeevich Grebenshchikov*, Michael Leder, Anatoly Volkov (Russian Federation)</td>
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<tr>
<td>12:00</td>
<td>T10-S4-3 Understanding the β-phase texture development in Ti-6Al-4V during compression in the α+β regimes</td>
<td>AUDITORIUM 450</td>
<td>Chi-Toan Nguyen*, Mario Balzer, Thomas Witulski, Benjamin Dod, Markus Boehm, Michael Preuss, João Quinta Da Fonseca (United Kingdom)</td>
</tr>
<tr>
<td>12:00</td>
<td>T10-S4-5 Microstructures evolution in a β quenched metastable β-Ti alloy during hot compression</td>
<td>AUDITORIUM 450</td>
<td>Ke Hua*, Yudong Zhang, Weimin Gan, Hongchao Kou, Benoit Beausir, Jinshan Li, Claude Esling (China)</td>
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<tr>
<td>12:00</td>
<td>T10-S4-6 Microstructure formation during thermomechanical processing in Ti-17 alloy</td>
<td>AUDITORIUM 450</td>
<td>Elango Chandiran, Goro Miyamoto, Tadashi Furuhara* (Japan)</td>
</tr>
<tr>
<td>12:00</td>
<td>Lunch in the exhibition area</td>
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</table>
**ROOM 300**

**T9-S8 | Microstructure properties relationships**

**Fatigue / Dwell fatigue I**

**T9-S8-1**
Why do titanium alloys withstand more strain under dwell-fatigue loadings than under fatigue loadings?  
*Samuel Hemery*, *Cyril Lavogiez*, *Azdine Nait-Ali*, *Mikael Gueguen*, *Patrick Villechaize* (France)

**T9-S8-2**
Study on dwell fatigue properties of near-α titanium alloy plates  
*Wenyuan Li*, *Jianrong Liu*, *Zhiyong Chen*, *Wenting Zhang*, *Liang Jin*, *Qingjiang Wang* (China)

**T9-S8-3**
Experimental and numerical investigation of cold-dwell fatigue in UD-rolled Ti64  
*Christos Triantafyllou*, *Darren Pagan*, *Andrew Mcbride* (United Kingdom)

**T9-S8-4**
The effect of loading direction on the dwell fatigue properties of Ti-6Al-4V forged bar with highly oriented texture  
*Kenichi Mori*, *Shohtaroh Hashimoto*, *Toshiyuki Okui*, *Yoshihisa Shirai*, *Mitsuho Miyahara* (Japan)

**T9-S8-5**
Alloy development and optimisation informed by an understanding of cold dwell fatigue sensitivity  
*Martin Bachè*, *Matthew Thomas* (United Kingdom)

**ROOM 200**

**T9-S12 | Microstructure properties relationships**

**TRIP / TWIP II**

**T9-S12-1**
Nucleation mechanism of {112}<111> mechanical twins in as-quenched β metastable Ti-12 wt.% Mo alloy  
*Matthieu Marteleur*, *Hosni Idrissi*, *Frederic Prima*, *Pascal Jacques* (Belgium)

**T9-S12-2**
On the fracture mechanisms of beta-metastable Ti-12 wt.% Mo alloy exhibiting TWIP-TRIP effects  
*Laurine Choisez*, *Matthieu Marteleur*, *Pascal Jacques* (Belgium)

**T9-S12-3**
An efficient way of designing Ti alloys with desirable deformation modes  
*G.-H. Zhao*, *M.B Ganza*, *M. Bignon*, *H. Eksandari Sabzi*, *X.Z. Liang*, *P.E.J. Rivera-Diaz-Del-Castillo* (United Kingdom)

**T9-S12-4**
The nature of the β → α′ transformation in Ti-Nb alloys  
*Emma Hildyard*, *Leigh Connor*, *Lewis Owen*, *Tamsin Whitfield*, *Howard Stone*, *Nick Jones* (United Kingdom)

**T9-S12-5**
Evolution of Omega Precipitates and their Influence on Mechanical Behavior of β-Titanium Alloys  
*Srinivas Aditya Mantri*, *Fan Sun*, *Riyadh Salloom*, *Frederic Prima*, *Srinivasan Sriniviputhur*, *Rajarshi Banerjee* (United States)

**ROOM 150**

**T9-S16 | Microstructure properties relationships**

**α-β alloys II**

**T9-S16-1**
Towards work-hardenability of Ti-6Al-4V through a quenching and partitioning approach  
*Odeline Dumas*, *Benjamin Hary*, *Guilhem Martin*, *Fan Sun*, *Charlotte De Formanoir*, *Frédéric Prima*, *Stéphane Godet* (Belgium)

**T9-S16-2**
Effect of heat treatment on the microstructure and mechanical properties of Ti-6.5Al-2Sn-4Zr-1Mo-2Nb-1W-0.2Si high-temperature titanium alloy  
*Xiaoqing Song*, *Yawei Diao*, *Wenjing Zhang*, *Wenjun Ye*, *Songping Hu* (China)

**T9-S16-3**
Effects of cold tandem rolling on microstructures and mechanical properties of TC16 titanium alloy wire for fastener use  
*Xiaoqing Sun*, *Hui Yang*, *Fengqi Hou* (China)

**T9-S16-4**
Evolution of the structure and properties of the Ti-3Al-2.5V alloy during pipes production by the TREX technology  
*Fedor Viktorovich Vodolazskiy*, *Yaroslav Kosmatov*, *Svetlana Illarionova*, *Natalia Barannikova*, *Elena Gornostaeva*, *Anatoly Illarionov* (Russian Federation)

**T9-S16-5**
Effects of heat treatment on microstructure and high-temperature properties of Ti-6Al-2Zr-1Mo-1V titanium alloy  
*Enen Xu* (China)

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**Lunch in the exhibition area**
### Wednesday, June 12th | 10:20-13:30

#### Room BC

<table>
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<tr>
<th>Time</th>
<th>Session</th>
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<tr>
<td>10:20</td>
<td><strong>T2-S4</strong></td>
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<tr>
<td>10:40</td>
<td><strong>T3-S4</strong></td>
</tr>
</tbody>
</table>
| 10:40  | **Keynote lecture** | Opportunities and challenges for the industrial Titanium market  
Rob Henson (United States) |
| 11:00  | **T2-S4-3** | The development progress of titanium alloy materials in WST  
Kaixuan Wang*, Puying Shi, Meiqi Lou, Wei Zhang, Xianghong Liu, Fengshou Zhang (China) |
| 11:20  | **T3-S4-3** | Development of elastically graded titanium alloys for biomedical applications  
Stéphanie Delannoy*, Sarah Baïz, Pascal Laheurte, Laurence Jordan, Frédéric Prima (France) |
| 11:20  | **T2-S4-4** | The smart materials and their introduction in composite materials for failure analysis investigations: Applications in new aero/esp/ial technologies  
Brahim Necib*, Mahrez Lahlah (Algeria) |
| 11:40  | **T3-S4-4** | Fatigue properties of beta-type Ti-Cr alloy with changeable Young's modulus  
Masaaki Nakai*, Mitsuo Niinomi (Japan) |
| 11:40  | **T2-S4-5** | Titanium for airframe applications in Airbus commercial aircrafts  
Benjamin Dod* (France) |
| 12:00  | **T3-S4-5** | Design, production and characterization of new β metastable Ti-Mo-Fe alloys with TWIP and TRIP effects for vascular stent applications  
Carolina C. Bortolan*, Leonardo C. Campanelli, Carlo Paternoster, Nicolas Giguère, Claudemiro Bolfarini, Diego Mantovani (Canada) |

#### Room I

<table>
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<tr>
<th>Time</th>
<th>Session</th>
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</table>
| 10:20  | **T3-S4-1** | Microstructure and mechanical properties of a beta titanium alloy for biomedical applications  
Seung Eon Kim*, Hyun Jun Kwon, Ka Ram Lim, Jae Keun Hong, Yong Taek Hyun (Republic of Korea) |
| 11:00  | **T3-S4-2** | Mechanical properties of TiNbCu biomedical shape memory alloy of hypereutectoid composition  
Hideki Hosoda*, Dai Inomata, Masaki Tahara (Japan) |
| 12:00  | **T3-S4-5** | Lunch in the exhibition area                                                              |

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*Note: * indicates corresponding author.
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<td><strong>T7-S2</strong></td>
<td>Marine, Gas and Other Industrial Applications</td>
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<td><strong>Session II</strong></td>
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</table>

**T7-S2-1** Tribological functionalization of titanium alloys by Micro-Arc Oxidation for marine applications  
_Aude Mathié*, Thierry Millot, Vincent Branger, Remy Müller (France)_

**T7-S2-2** The improvement of fatigue performance on surface-damaged Ti-6Al-4V alloy by ultrasonic surface rolling process  
_Ni Ao*, Daoxin Liu, Xiaohua Zhang (China)_

**T7-S2-3** Keynote lecture  
_Application of Titanium and its alloys for automobile parts_  
_Kazuhiro Takahashi (Japan)_

**T8-S4-1** Beta flick formation in titanium alloys  
_Alec Mitchell*, Kanchan Kelkar (Canada)_

**T8-S4-2** Effect of melting interruption on composition and microstructure of BT22 in VAR  
_Zhengli Hua*, Wenzhong Luo, Qiang Lei, Tao He, Kaixuan Wang, Xianghong Liu (China)_

**T8-S4-3** Freckles pattern and microstructure feature of Nb-Ti alloy produced by vacuum arc remelting  
_Jinjin Shang*, Yongsheng He, Ce Yang, Ming Wu, Wenzhong Luo, Kaixuan Wang (China)_

**T8-S4-4** Macrostructure control of titanium alloys in Vacuum arc remelting  
_Xiaohua Zhao*, Wei Wu, Peng Liu, Yongsheng He, Kaixuan Wang, Xianghong Liu (China)_

Lunch in the exhibition area
### Wednesday, June 12th | 13:30-15:50

#### Auditorium 800

<table>
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<th>13:30</th>
<th>T1-S5</th>
<th>Additive and near netshape manufacturing Process / Microstructure III</th>
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</table>

**Keynote lecture**
Scientific and technological advances on additive manufacturing of high-performance large critical Titanium structural components for the aerospace industries

H.-M. Wang (China)

#### Auditorium 450

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**T10-S5-1** A physical based model for the hot deformation behaviour of a Ti17 alloy

Ricardo Buzolin*, Michael Lasnik, Alfred Krumphals, Friedrich Krumphals, Maria Cecilia Poletti (Austria)

| 14:10 | T10-S5-2 | Dynamic evolution of alpha phase during stress relaxation in Ti-7333 titanium alloy

Hongchao Kou*, Chenlu Jia, Nana Chen, Zhihong Wu, Jinshan Li (China) |

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<th>14:30</th>
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</table>

**T10-S5-3** Evolutionary map of microstructure and texture of a new high temperature titanium alloy during hot deformation

Zhixin Zhang*, Jinshan Li, Jiangkun Fan, Bin Tang, Hongchao Kou, Jian Wang, Qingjiang Wang, Zhiyong Chen (China)

#### Auditorium 800

| 14:10 | T1-S5-3 | Processing-microstructure-property relationship in additive manufactured (Laser engineered net shaping, LENS-processed) Ti-6Al-4V Alloy

Souvik Sahoo*, Anuja Joshi, Vamsi Balla, Mitun Das, Shibayan Roy (India) |

| 14:30 | T1-S5-4 | High integrity joining techniques for titanium alloys of complex geometry-powder interlayer-bonding

Heenan Tomos Watkins*, Helen Davies, Silvia Marchisio (United Kingdom) |

| 14:50 | T1-S5-5 | Microstructure and properties of 3D Ti-6Al-4V articles produced with advanced co-axial electron beam & wire additive manufacturing technology

Dmytro Kovalchuk*, Orest Ivasishin, Dmytro Savvakin (Ukraine) |

#### Auditorium 450

| 15:10 | T10-S5-4 | Deformation behavior and microstructure evolution in the isothermal compression of Cast Ti-5Al-5Mo-5V-1Cr-1Fe alloy

Jixiong Liu*, Ning Ding, Qi Gao, Miaoquan Li, Dingchun Wang, Jian Wang (China) |

| 15:30 | T10-S5-5 | Direct evidence for a dynamic phase transformation during high temperature deformation in Ti-64

Christopher Stuart Daniel, Chi-Toan Nguyen, Michael Atkinson, Jooa Quinta Da Fonseca* (United Kingdom) |

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</table>

**T10-S5-6** Flow behaviour of Ti6Al4V under large strains

Katharina Hogrefe, Ricardo Buzolin, Maria Cecilia Poletti* (Austria)

<p>| 15:30 | Coffee break in the exhibition area |</p>
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<tr>
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<tr>
<td><strong>T9-S9-1</strong></td>
<td>Impact of temperature and microstructure on dwell fatigue in dual-phase titanium alloys</td>
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<tr>
<td>Michelle Harr*, Samantha Daly, Adam Pilchak (United States)</td>
<td><strong>T9-S13-1</strong> Influence of microstructural evolution during thermal aging on plastic deformation of β-type Ti-12V-2Fe-Al alloy</td>
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<tr>
<td><strong>T9-S9-2</strong></td>
<td>The rupture life prediction in cold dwell fatigue of Ti-6Al-4V based on the creep deformation</td>
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<tr>
<td>Yutaro Ota*, Tomomichi Ozaki, Keiji Kubushi (Japan)</td>
<td><strong>T9-S13-2</strong> Twinning behaviour of beta phase with similar chemical composition in beta and alpha+ beta titanium alloys</td>
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<td><strong>T9-S9-3</strong></td>
<td>Cyclic creep behaviour of two-phase Ti-6Al-2Mo-2Cr alloy</td>
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<td>Waldemar Zioja*, Maciej Motyka, Krzysztof Kubias, Jan Sieniawski (Poland)</td>
<td><strong>T9-S13-3</strong> Fine-tuning of stress-induced martensite in TRIP/TWIP Ti alloys</td>
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<td><strong>T9-S9-4</strong></td>
<td>Revisiting low-cycle fatigue and dwell-fatigue crack initiation in Ti-6Al-4V</td>
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<tr>
<td>Cyril Lavogiez*, Samuel Hemery, Patrick Villechaize (France)</td>
<td><strong>T9-S13-4</strong> Predicting Ti alloys properties: Machine learning as a bridge between experimental results and a binito predictions</td>
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<td><strong>T9-S9-5</strong></td>
<td>Cold dwell fatigue behaviour of Ti6242 forged disk with a bimodal microstructure</td>
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<td>Jianke Qu*, Haibin Ji, Yingjie Ma, Jiaofeng Lei, Yuyin Liu, Rui Yang (China)</td>
<td><strong>T9-S13-5</strong> Modelling the composition dependence of transformation induced plasticity (TRIP) in metastable beta titanium alloys</td>
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<tr>
<td><strong>T9-S9-6</strong></td>
<td>Data driven tools and methods for microtexture classification and dwell fatigue life prediction in dual phase titanium alloys</td>
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<tr>
<td>Vassilis Venkatesh*, Ryan Norras, Adam Pilchak, Sesh Tamirisakandala, Kayla Colvert, Ayman Salem, Thomas Broderick, Michael Glavivic, Ian Dempster, Vikas Saraf (United States)</td>
<td><strong>T9-S13-6</strong> Strain-hardenability of new strengthened TRIP/TWIP titanium alloys</td>
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<tr>
<td><strong>T9-S17-1</strong></td>
<td>Influence of microstructures on tensile properties at 400°C of TC4 Titanium alloy</td>
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<tr>
<td>Yong Ren*, Nan Yang, Nan Yang, Puying Shi, Jinwen Lei, Yuxuan Du (China)</td>
<td><strong>T9-S17-2</strong> Characterization of alpha case and its effects on titanium alloy properties</td>
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<tr>
<td><strong>T9-S17-3</strong></td>
<td>The effect of aging treatment on the microstructure and properties of an (α+β) titanium alloy with high content of Al</td>
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<tr>
<td>Wenjing Zhang* (China)</td>
<td><strong>T9-S17-4</strong> Study on the microstructure and mechanical properties of powder metallurgy TA15 titanium alloy</td>
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<td><strong>T9-S17-5</strong></td>
<td>Processing—microstructure—property correlations in Ti6Al4V alloy</td>
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<tr>
<td>Indranil Sen*, Prakashy Nati, Lakshindra Murand (India)</td>
<td><strong>T9-S17-6</strong> Structure and properties of layered Ti-6Al-4V based materials fabricated using blended elemental powder metallurgy</td>
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<tr>
<td>Sergey Prikhodko*, Orest Ivashin, Pavlo Markovsky, Dmytro Savvakin, Alexandr Stasyuk (United States)</td>
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</table>
WEDNESDAY, JUNE 12TH | 13:30-15:50

ROOM BC | T2-S5 | Aerospace applications
High temperature properties

13:30
T2-S5-1 Creep rupture behavior of electron beam welded dissimilar joint of Ti60 and TC17 titanium alloys
Zhiyang Chen*, Weitang Zhang, Liang Jin, Qingjiang Wang (China)

13:40
T2-S5-2 Improving the high temperature oxidation resistance of Ti-beta21S by mechanical surface treatments
Luc Lavisse*, Armand Kanjer, Karine Cheveau, Patrice Peyre, Cyril Gornay, Manuel François, Pascal Berger, Albert Tidu, Christophe Shuman, Virgil Optasanu, Tony Montesin, Marie Del Carmen Marco De Lucas (France)

14:00
T2-S5-3 Effect of silicon on creep properties of titanium 6Al-2Sn-4Zr-2Mo alloy
Marta-Lena Antti*, Verónica Collado Ciprés, Johanne Mouzon, Pia Åkerfeldt, Robert Pederson (Sweden)

14:30
T2-S5-4 Tensile properties of α-titanium alloys at elevated temperatures
Tarik Nawaya*, Axel Von Hehl, Werner Beck (Germany)

14:50
T2-S5-5 Role of refractory elements in near-alpha titanium alloys on high temperature mechanical properties
Zhao Huvelin*, C. Gouroglian, N. Horézan, Shigehisa Naka (France)

15:10
T2-S5-6 Properties of novel high temperature titanium alloys for aerospace applications
John Mantione*, Matias Garcia-Avila, Matthew Arnold, David Bryan, John Foltz (United States)

ROOM I | T3-S5 | Biomedical and Healthcare Applications
Environment

13:30
T3-S5-1 Creep rupture behavior of electron beam welded dissimilar joint of Ti60 and TC17 titanium alloys
Zhiyang Chen*, Weitang Zhang, Liang Jin, Qingjiang Wang (China)

13:40
T3-S5-2 Fretting wear of a titanium-cobalt biomedical alloy couple in a body fluid: Chemical and structural alterations of the sub-surfaces
Shanoob Balachandran Nair*, David Mayweg, Dierk Raabe, Markus Wimmer, Alfons Fischer, Michael Herbig (Germany)

14:00
T3-S5-3 Fabrication and bioresorbability of Ag- and Ta-containing amorphous calcium phosphate films formed on titanium substrates by RF magnetron sputtering
Jun Wu*, Kyosuke Ueda, Takayuki Narushima (Japan)

14:30
T3-S5-4 How biocompatible titanium-based alloys can be designed for endovascular stent applications
Muhammad Farzik Ijaz, Philippe Castany, Fan Sun, Raluca Ion, Doima-Margareta Gordin, Anisoara Cimpean, Frédéric Prima, Thierry Gloriant* (France)

14:50
T3-S5-5 Mechanical and functional response in Surface treated low modulus Ti-Nb-Ta alloys
Srijan Acharya*, Shaurya Singh Dabas, Satyam Suwas, Kaushik Chatterjee (India)

15:10
T3-S5-6 Effect of Nb addition on high temperature oxidation behavior, oxide layer structure, and its exfoliation resistance of Ti-Nb Alloys
Eri Miura Fujikawa*, Yuya Ogawa, Tohru Yamasaki (Japan)

15:30
Coffee break in the exhibition area
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<td>**T4-S1</td>
<td>Environmental Behavior**&lt;br&gt;<strong>Session I</strong></td>
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</table>

**T4-S1-1** Oxidation of Ti–6Al–4V alloy between 450 and 600°C. Evolution of microstructure and mechanical properties
*Dominique Poquillon*, Coralie Parrenos, Benoit Malard, Alexandre Pugliara (France)

**T1-S7-1** Direct laser additive manufacturing of TiAl intermetallic compound by powder directed energy deposition
*Damien Choron*, Serge Naveos, Marc Thomas, Johan Petit, Didier Boisselier (France)

**T4-S1-2** The nitrogen effect on the oxidation behaviour of Ti6242S titanium-based alloy: Contribution of atom probe tomography
*Charlotte Doupresse, Marion Descoins, Aurélie Vande Put, Dominique Mangelinck, Philippe Emile, Daniel Monceau* (France)

**T1-S7-2** Comparison of microstructure and fracture toughness of TiAl alloy prepared by selective electron beam melting and electron beam smelting
*Yuyang Chen*, Hangyu Yue, Xiaopeng Wang, Ping Sun (China)

**T4-S1-3** Suppressing the oxygen ingress into Ti-alloys by a one-step Al- plus F-treatment
*Alexander Donchev*, Mathias Galetz (Germany)

**T1-S7-3** The investigation of tensile anisotropy and fatigue crack initiation in electron beam melted Ti-48Al-2Cr-2Nb
*Bochao Lin*, Wei Chen, Zheyuan Chen, Yang Yang (China)

**T4-S1-4** Corrosion of titanium alloys in pressurized water at 300 °C and 15 MPa
*Quentin Bignon, Quentin Auzoux*, Frantz Martin, Amandine Raynal, Frédéric Miserque, Michel Tabarant, Laurence Lutu-Romain, Yves Wouters (France)

**T1-S7-4** Microstructure evolution and mechanical properties of electron beam melted β phase stabilized γ-TiAl alloy
*Lakshmi Narayana*, Cheng-Lin Li, Seong Woo Choi, Seong Wook Kim, Seung Eon Kim, Jong Taek Yeom, Joe Kunn Hong, N Subba Reddy (Republic of Korea)

**T4-S1-5** Research progress and trend of plasma metallurgy on titanium metallic surface
*Zhengxian Li*, Wen Zhao, Shouchang Ji, Zhong Xu, Lian Zhou (China)

**T1-S7-5** Deformation behavior of high temperature TiAl Alloy and Ti2AlNb Alloy
*Lei Zhu*, Jinshan Li, Bin Tang, Hongchao Kou (China)

**T4-S1-6** Oxygen/nitrogen-assisted degradation of the mechanical behavior of titanium alloys exposed at elevated temperature
*Damien Texier*, Quentin Sirvin, Vincent Veloy, Mehdi Salem, Daniel Monceau, Benoit Mazères, Eric Andrieu, Rémi Roumiguier, Benjamin-B Dod (France)

**T1-S7-6** Breakthrough of B2 forging technology for a Ti2AlNb based alloy
*Wenlong Zeng* (China)

Coffee break in the exhibition area
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<td><strong>T1-S6-2</strong> Selective laser melting of titanium alloys with isotropic microstructures</td>
<td>Pere Barriobero Vila*, Joachim Gussone, Andreas Stark, Norbert Schell, Jan Haubrich, Guillermo Requena (Germany)</td>
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<td>Priyanka Agrawal, Maria Quintana, Matthew Kenney, Peter Collins* (United States)</td>
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<td><strong>T1-S6-4</strong> Study on the origins of residual stresses in Ti-6Al-4V processed by additive manufacturing</td>
<td>Nathan Dumontet*, Benoit Malard, Bernard Viguier (France)</td>
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<td><strong>T1-S6-5</strong> An innovative method to assess and manage residual stresses in additively manufactured titanium</td>
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<td>Sergey Zherebtsov*, Maxim Ozerov, Margarita Klimova, Nikita Stepanov (Russian Federation)</td>
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<td>Haoyuan Ma*, Weidong Zeng, Youping Zheng, Xiongxiong Gao (China)</td>
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<td><strong>T10-S6-4</strong> Refinement of lamellar structure in γ-TiAl through pseudospinodal decomposition mechanism: A phase field study</td>
<td>Tianlong Zhang*, Dong Wang, Yunzhi Wang (China)</td>
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<td><strong>T10-S6-5</strong> Phase separation and up-hill diffusion in the ordered alpha2 compound of a gamma- Ti-Al-Nb alloy</td>
<td>Heike Gabrisch*, Tobias Krekeler, Uwe Lorenz, Marcus Willi Rackel, Martin Ritter, Florian Pyczak, Andreas Stark (Germany)</td>
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### Posters visits

**Wednesday, June 12th | 15:50-19:30**
T9-S10 | Microstructure properties relationships
Creep

T9-S10-1 Cold dwell fatigue life assessment of Ti-6Al-4V alloy based on the linear damage summation rule
Keiji Kubushiro*, Yutaro Ota (Japan)

T9-S10-2 High-stress compressive creep behavior of Ti-6Al-4V alloys with different microstructure
Zhenhua Dan*, Jifei Lu, Hui Chang, Lian Zhou (China)

T9-S10-3 Understanding strain localisation behaviour in a near-α Ti-alloy subjected to cold-creep testing
Caudius Dichtl*, Matthew Thomas, Kate Fox, Rebecca Sandala, David Rugg, Joao Fonseca, Michael Preuss (United Kingdom)

T9-S10-4 Effect of cooling rate on the creep deformation of beta Ti-6242S elevated temperatures
M.C. Brandes*, R.W. Hayes, M.J. Mills (United States)

T9-S10-5 Strain rate sensitivity of titanium alloys: experimental results and multiscale models
Jean-Loup B.V. Strudel, Arina Marchenko, Helene Jousset, Loic Naze*, Samuel Forest (France)

T9-S14 | Microstructure properties relationships
β alloys

T9-S14-1 Microstructure and tensile property in two novel β titanium alloys with multiscale distribution of α phase
Wenguang Zhu*, Jia Lei, Qiaoan Sun, Lin Xiao, Jun Sun (China)

T9-S14-2 The Microstructural Evolution and Mechanical Behavior of Fe and Al modified Ti-13Cr( wt. %)
Joann Ballor, Vahid Khademi, Masahiko Ikeda, Jane Howe, Toshi Sunooshi, Carl Boehlert* (United States)

T9-S14-3 Microstructure evolution and mechanical properties response to metastable β titanium alloy Ti-7333 under thermomechanical treatment
Nana Chen*, Hongchao Kou, Jon Molina-Aladрегуía, Jinshan Li (China)

T9-S14-4 Formation of hierarchic structure during primary hot working of Ti-5Al-5Mo-5V-3Cr-12r alloy in the two-phase region
Li Wang*, Xiao Guang Fan, Wei Juan Liang (China)

T9-S14-5 The effect of heat treatment on the microstructure and properties of Ti-65541 high strength titanium alloy
Hangjiang Li*, Lin-Lin Cui, Xiang-Hong Liu, Feng-Shou Zhang, Jun-Qi Du (China)

T9-S14-6 Multi-scale and Multi-technic Microstructure Analysis of Linear Friction Welds of two Titanium Alloy grades: the β-metastable Ti-5Al-2Sn-Zr-4Mo-4Cr (Ti17) and the near-α Ti-6Al-2Sn-4Zr-2Mo (Ti6242)
Salima Bouvier, Risbet Marion, Dorick Ballat-Durand* (France)

T9-S18 | Microstructure properties relationships
Welding

T9-S18-1 Some data on the influence of structure and chemical composition on the ratio of fracture toughness and tensile brittleness of titanium alloys
Anatoly Volkov*, Michael Leder, Alexander Gребенщиков, Elena Shushakova, Natalia Volkova, Anatoly Suyazhin, Kirill Rusakov, Maxim Kalienko (Russian Federation)

T9-S18-2 Comparison of different titanium alloys welded by Yb:YAG fibre laser for thin sheet applications used for T-ducts in bleed air systems
Stefan Riekehr*, Volker Ventzke, Sabine Wagner, Werner Beck, Nikolai Kashoev (Germany)

T9-S18-3 Change of microstructure and properties of dual titanium alloy join interface in hot working history
Zekun Yao*, Yongguan Ning, Zhanglong Zhao, Darong Huang, Hongzhen Guo, Jinyuan Shen (China)

T9-S18-4 Yb: YAG laser welding of Ti6Al4V sheet using conventional and annular power density distribution: microstructure mechanical properties relationship
Jean-Denis Beguin, Valentin Gazagne, Yannick Balcaen*, Joel Alexis (France)
**WEDNESDAY, JUNE 12TH | 15:50-19:30**

**ROOM BC**

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<td>A high strength beta titanium alloy for fasteners and additive manufacturing</td>
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<td>T2-S6-2</td>
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<td>Goro Yamamoto, Yoshinori Yoshida, Kenta Yamanaka, Mitsuo Niinomi, Yoshio</td>
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<td><em>Ali El-Chaikh</em>, Andre Danzig, Daniel Muenter (Germany)</td>
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<td><em>Rubens Caram</em>, Mariana Mello (Brazil)</td>
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<td><em>Josef Strasky</em>, Jiri Kozlik, Tomas Chraska, Dulibor Preisler (Czech Republic)*</td>
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<td>T3-S6-5</td>
<td>Effect of mechanical surface treatments on the high temperature oxidation of</td>
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<td><em>Takumi Haruna</em>, Daiki Morihashi, Youhei Hirohata (Japan)</td>
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**17:30**

**Posters visits**
### ROOM G

**T4-S2 | Environmental Behavior**  
Session II

**Keynote lecture**  
Environmental effects on fatigue and SCC  
*David Dye (United Kingdom)*

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<td>Laser based additive manufacturing of intermetallic TiAl-alloys</td>
<td>Silja-Katharina Rittinghaus*, Andreas Vogelpoth, Veronica Rocío Molina Ramirez, Janett Schmelzer, Ulrike Hecht (Germany)</td>
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### ROOM H

**T6-S1 | Intermetallics and MMCs**  
Elaboration

**Keynote lecture**  
Titanium aluminides - Status of the production of ingots, semi-finished products and powders  
*Volker Güther (Germany)*

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<td>Advancement of plasma cold-hearth melting for production of gamma titanium aluminide alloys within arconic</td>
<td>Ernie Crist*, Fusheng Sun, Michael Jacques, Birendra Jena, Matthew Dahar, Don Li (United States)</td>
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<td>Correlation between susceptibility to environment-assisted cracking of super-elastic TiNi alloy and the states and their amount of hydrogen in it</td>
<td>Takumi Haruna*, Daiki Moriihashi, Youhei Hirohata (Japan)</td>
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<td>Zhenbo Zhang*, Philip Platt, David Lunt, Michael Preuss (United Kingdom)</td>
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THURSDAY, JUNE 13TH | 08:00-10:20

AUDITORIUM 800

T1-S8 | Additive and near netshape manufacturing
Microstructure / Properties I

08:00
T1-S8-1 Microscopic strain localisation in WAAM Ti-6Al-4V during uniaxial tensile loading
David Lunt*, Alistair Ho, Alec Davis, João Quinta Do Fonseca, Philip Prangnell (United Kingdom)

08:20
T1-S8-2 Refined microstructure and isotropic mechanical properties in Ti-6Al-4V made by direct energy deposition additive manufacturing
Kai Zhang*, Xinni Tian, Xigen Zhou, Aijun Huang, Xinhua Wu (Australia)

08:40
T1-S8-3 Influence of heat treatment on the nano-fatigue behavior of an additively manufactured β titanium alloy
Erika Gabriele Alves Alcântara*, Ilaria Nigro, Georg Gerlitzky, Eckart Uhlmann, Claudia Fleck (Germany)

09:00
T1-S8-4 Role of martensite decomposition in tensile property of selective laser melted Ti-6Al-4V
Sheng Cao*, Samuel Chao Voon Lim, Aijun Huang, Xinhua Wu (Australia)

09:20
T1-S8-5 Micromechanical behavior and thermal stability of a dual-phase α+α’ titanium alloy produced by additive manufacturing
Stéphane Godet, Guilhem Martin, Frédéric Prima, Sébastien Allain, Yves Bréchet, Benjamin Hary*, Charlotte de Formanoir (Belgium)

10:00
T1-S8-6 On the orientation relationship between α and β phases at grain boundary and in the grain interior for Ti-6Al-4V alloy
Souvik Sahoo*, Shibayan Roy (India)

AUDITORIUM 450

T10-S7 | Microstructure evolution
Generalities

08:00
T10-S7-1 Development of CALPHAD databases for both Ti- and TiAl-based alloys
Yang Yang*, Hai-Lin Chen, Qing Chen, Anders Engström (Sweden)

08:20
T10-S7-2 Phase structures and phase transitions of titanium element
Lei Li* (China)

08:40
T10-S7-3 Computational approach to microstructure parameters and their influence on plastic deformation of γ-TiAl alloy
Hao Wang*, Zhen Chen, Yan He, Qili Bao, Aidong Tu, Gang Zhou, Chunyu Teng, Chenguang Bai, Dongsheng Xu, Qingmiao Hu, Rui Yang (China)

09:00
T10-S7-4 In-situ measurement of the β to α phase transformation kinetics in Ti alloys using laser ultrasonics
Mariana C. Mendes Rodrigues*, Thomas Garcin, Matthias Militzer (Canada)

09:20
T10-S7-5 Influence of microtexture on ultrasonic reflection in Ti-6Al-4V alloy hot-forged in α+β region
Yoshinori Ito*, Hiroyuki Takamatsu, Shogo Saeki, Nobuhiro Tsuji (Japan)

10:00
T10-S7-6 On the orientation relationship between α and β phases at grain boundary and in the grain interior for Ti-6Al-4V alloy
Souvik Sahoo*, Shibayan Roy (India)

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*Toshiaki Iwata* (Japan) |
| T9-S19-2 Fabrication of Ti-6Al-4V fatigue samples with controlled internal defects  
*Arnaud Junet, Xavier Boulnat*, Arnaud Weck, Jean-Yves Buffiere (France) |
| T9-S19-3 Effect of stress ratio and stress concentration factor on fatigue properties of WSTi6211 titanium alloy  
*Fang Hao* (China) |
| T9-S19-4 The high-cycle fatigue behavior and damage mechanism of a Ti-6Al-4V alloy with transverse texture  
*Wei Chen*, Yunyi Liu, Zhiquang Li, Bing Tang (China) |
| T9-S19-5 Cyclic deformation and microplasticity behavior study of near-β titanium alloy under high-cycle fatigue loading: crystal plasticity simulations and experiments  
*Mengqi Zhang*, Bin Tang, Ruimeng Yang, William Yi Wang, Wei Chen, Hongchao Kou, Jinshan Li (China) |
| T9-S19-6 Effect of microstructure on the very high cycle fatigue strength of Ti-6Al-4Mo alloy  
*Andrey Shanyavskiy, Thierry Pain-Luc*, Alexander Nikitin (Russian Federation) |

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*Masahiko Morinaga*, Hiroshi Yukawa, Masahito Yoshino (Japan) |
| T9-S21-2 Theoretical investigation of the phase stability and elastic properties of Ti-X alloys  
*Ryoji Sahara*, Wenchong Zhou, Koichi Tsuchiya (Japan) |
| T9-S21-3 Approaching the optimized size of Ti3Al particles in alpha-Ti alloys: a molecular dynamics study  
*Yan He, Hao Wang, Yingjie Ma, Dongsheng Xu*, Rui Yang (China) |
| T9-S21-4 Stress partitioning in a beta-metastable Titanium alloy induced by elastic and plastic phase anisotropies: experimental and modeling  
*Ravi Raj Purohit P. R. P.*, Safaa Lhadi, Nathalie Gey, Olivier Castelnau, Thiebaut Richeton, Lionel Germain, Stephane Berbenni (France) |
| T9-S21-5 A study on the micromechanical behaviors of Ti55531 titanium alloys with refined lamellar microstructure by in situ neutron diffraction  
*Yimin Cui*, Weiwei Zheng, Stefanus Harjo, Chaohua Li, Runguang Li, Yandong Wang (China) |
| T9-S21-6 Superior plasticity stability and excellent strength in Ti-55531 alloy micropillars via harmony slip in nanoscale α/β phases  
*Wenjuan Kou*, Qiaoqian Sun, Lin Xiao, Jun Sun (China) |

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*Thomas Lundin Christiansen*, Morten S. Jellesen, Marcel A.J. Somers (Denmark) |
| T9-S23-2 Gaseous thermochemical surface treatment of Ti-6Al-4V and the influence of heat treatment  
*Yichen Meng*, Nikolaj Henriksen, Thomas Christiansen, Matteo Villa, Kristian Dahl, Marcel Somers (Denmark) |
| T9-S23-3 Development of high temperature resistant titanium alloy arconic-THOR  
*Fusheng Sun*, Ernie Crist (United States) |
| T9-S23-4 Study on the pack rolling process factor of Ti-6Al-4V alloy  
*Miseon Choi*, Hyunseok Lee (Republic of Korea) |
| T9-S23-5 Study on the pack rolling process factor of Ti-6Al-4V alloy  
*Miseon Choi*, Hyunseok Lee (Republic of Korea) |
| T9-S23-6 Mechanisms of oxide dependant tribological behaviour in Ti / Steel sliding and influence of nanostructured surfaces  
*Pierre Maurel*, Laurent Weiss, Eric Fleury, Philippe Bocher, Thierry Grosdidier (France) |

Coffee break in the exhibition area
THURSDAY, JUNE 13TH | 08:00-10:20

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  Mario Báizer*, Thomas Witulski (Germany) |
| 08:20 | **T11-S3-2** Development of porous titanium sheet with high porosity and good mechanical properties  
  Yasuhiro Goto*, Yosuke Inoue, Hideki Fujii, Matsuhide Horikawa (Japan) |
| 08:40 | **T11-S3-3** Cold caliber-rolling of Ti-13Nb-13Zr alloy to obtain high strength and low elastic modulus  
  Taekyung Lee*, Chong Soo Lee, Chan Hee Park (Republic of Korea) |
| 09:00 | **T11-S3-4** Microstructure-property relationships in cold rollable, high-strength α/β alloys  
  John Foltz* (United States) |
| 09:20 | **T11-S3-5** Modeling and verification of stress relaxation behavior of Ti-6Al-4V  
  Xingzhen Zhang, Ying Deng*, Shihan Jin, Weidong Li (China) |
| 09:40 | **T11-S3-6** Towards a mechanistic understanding of the effect titanium alloy composition and tool coating have on drilling machinability  
  Alex Graves*, Maria Teike, Susanne Norgren, Pete Crawforth, Martin Jackson (United Kingdom) |

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  Jiri Kozlik*, Petr Hacrub, Josef Strasky, Hanka Becker, Max Hoppe, Milos Janecek (Czech Republic) |
| 08:20 | **T10-S9-2** Boundary misorientation distribution in Ti 6Al-4V alloy during various stages of processing  
  Shibayan Roy*, Satyam Suwas (India) |
| 08:40 | **T10-S9-3** Ultrasonic velocity variation of Ti6Al4V Ti-alloy bars under conventional forging combined with triple heat treatment  
  Feixiao Han* (China) |
| 09:00 | **T10-S9-4** Characterization and modeling of abnormal grain growth in Beta-Annealed Ti-6Al-4V  
  Adam Pilchak*, Shesh Srivatsa, Nathan Levkulich, Vikas Sinha, Eric Payton, Lee Semiatin (United States) |
| 09:20 | **T10-S9-5** Abnormal grain growth in Ti-6Al-4V alloy during β annealing  
  Denis Solas*, Antoine Paris, Anne-Laure Helbert, Thierry Baudin, François Brisset, Benjamin Dod, Romain Forestier (France) |
| 09:40 | **T10-S9-6** Analysis of the development of abnormal grains structures during Beta annealing of Ti-64 wrought products  
  Nicholas Byres*, Pratheek Shanthiraj, Benjamine Dod, João Quinta Da Fonseca, Phil B Prangnell (United Kingdom) |
<p>| 10:00 | Coffee break in the exhibition area |</p>
<table>
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<tr>
<th>ROOM G</th>
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</table>
| **T6-S2 | Intermetallics and MMCs**  
Mechanical properties of intermetallics I | **T5-S1 | Extraction and Powder Production**  
Powder I |

### Keynote lecture
Near netshape forming of Ti-Al based intermetallic alloys  
*Ruy Yang (China)*

### T6-S2-3 Grain refinement and deformation behavior of a phase in TNM intermetallic during high-temperature uniaxial compression  
*Fengming Qiang*, Hongchao Kou, Emmanuel Bouzy, Yudong Zhang, Jinshan Li (Republic of Korea)

### T5-S1-1 Microstructure and properties of low-titanium Nitinol powder manufactured by Supreme-Speed PREP  
*Ting Gao, Xiaohao Zhao, Shujin Liang, Yunjin Lei, Qingxiang Wang, Yu Cao* (China)

### T5-S1-2 Development of α/β Titanium and Ti aluminide powder: Thermodynamics and high energy milling process  
*Kalendo Mutombo Mutombo* (South Africa)

### T6-S2-4 Texture development and microstructure control of hot deformed TiAl base intermetallic compounds  
*Myung-Hoon Oh*, Sung-Hyun Park, Jae-Kwon Kim, Ji-Ho Lee, Seong-Woong Kim, Seung-Eon Kim, No-Jin Park (Republic of Korea)

### T5-S1-3 Atomisation of Ti-64 alloy using the EIGA process: comparison of the characteristics of powders produced in lab-scale and industrial-scale facilities  
*Stefan Drawin*, Agathe Deborde, Marc Thomas, Michel Pierronnet, Layla Sasaki, Jérôme Delfosse, Olivier Godde (France)

### T6-S2-5 Hot-forming of gamma TiAl alloys studied during processing with synchrotron X-ray radiation  
*Andreas Stark*, Marcus W. Rackel, Michael Oehring, Florian Pyczak (Germany)

### T5-S1-4 Rapid preparation of titanium suboxides particles by hydrogen reduction of H2TiO3  
*Baoqiang Xu*, Ding Zhao, Weiran Zhai, Jia Yang, Jian Wu, Minghui Liu, Bin Yang (China)

### T6-S2-6 Integrated computational materials engineering of gamma titanium aluminides for aerospace applications  
*Sesh A Tamirisakandala*, Matthew Dahar, John Lewandowski (United States)

### Keynote lecture
A new process for production of low cost Ti powder and the sintering of Ti alloy powder to achieve wrought-like microstructure and mechanical properties  
*Zhigang Zak Fang (United States)*

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Coffee break in the exhibition area
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<td>10:20</td>
<td>T1-S9-1 In situ synchrotron X-ray diffraction line-profile analysis of additively manufactured Ti-6Al-4V alloy under tensile deformation</td>
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<td>10:40</td>
<td>T1-S9-2 Taming the porosity issue of SLM additive manufacturing by material design</td>
<td>AUDITORIUM 800</td>
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<td>11:00</td>
<td>T1-S9-3 X-ray micro tomography study of internal defects of electron beam melted Ti-6Al-4V and their effect on fatigue behavior</td>
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<tr>
<td>11:40</td>
<td>T1-S9-5 The influence of microstructure on mechanical properties of SLM 3D printed Ti6Al4V</td>
<td>AUDITORIUM 800</td>
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<td>12:00</td>
<td>Lunch in the exhibition area</td>
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<td>13:30</td>
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<tr>
<td>10:40</td>
<td>T10-S8-1 Phase transformation and Microstructure evolution of Ti-Al-Fe alloy during continuous cooling</td>
<td>AUDITORIUM 450</td>
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<tr>
<td>11:00</td>
<td>T10-S8-2 Phase transformation sequence of Ti-6Al-4V as a function of the cooling rate</td>
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<td>11:40</td>
<td>T10-S8-3 Origins and importance of fine secondary alpha in slowly cooled Ti6Al4V</td>
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<tr>
<td>12:00</td>
<td>T10-S8-4 The growth kinetics of Widmanstatten plates investigated by phase field calculations</td>
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<tr>
<td>12:00</td>
<td>T10-S8-5 Gaseous thermochemical synthesis and characterization of mixed interstitial phases in the Ti-C-O-N system</td>
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**Afternoon**

**Industrial visits** - Registration mandatory - limited number of seats

**20:00** Gala Dinner | **The Machines of Nantes Isle**
Registration mandatory: 80 € per participant
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<tr>
<td>T9-S20</td>
<td>Microstructure properties relationships Dynamic loadings</td>
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<tr>
<td>T9-S22</td>
<td>Microstructure properties relationships Deformation / β alloys</td>
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<tr>
<td>T9-S24</td>
<td>Microstructure properties relationships Residual stress / Surface properties</td>
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<tr>
<td>T9-S22-1</td>
<td>A new methodology for high-throughput screening of composition-microstructure-micromechanical/properties relationships</td>
<td>Yuwen Cui*, Hui Chang, Lian Zhou (Spain)</td>
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<tr>
<td>T9-S22-2</td>
<td>TEM observation of precipitates and their role to mechanical properties in Ti-5553 alloy heated to some temperatures to 923 K</td>
<td>Eiichi Sukekoda*, Elisabeth Aebly-Gautier, Moukrane Dehmas (Japan)</td>
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<td>T9-S22-3</td>
<td>Microstructure and mechanical properties evolution of Beta215S titanium alloy after aging</td>
<td>Bernard Vigier*, Heloise Bearnard-Devié, Anne Mathieu, Aurélie Soula (France)</td>
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<td>T9-S22-4</td>
<td>Quantitative study of ω phase precipitation and its effect on Portevin - Le Chatelier (PLC) effect in Ti-Mo metastable β alloys</td>
<td>Philippe Castany*, Shiyou Luo, Sandrine Thuiller, Thierry Gloriant (France)</td>
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<tr>
<td>T9-S22-5</td>
<td>The influence of ternary and quaternary alloy additions on the superelastic behaviour of metastable Ti-Nb based alloys</td>
<td>Nick Jones*, Emma Hildyard, Leigh Connor (United Kingdom)</td>
</tr>
<tr>
<td>T9-S22-6</td>
<td>Diffusion wear mechanisms of WC-10%Co carbide tools during dry machining of Ti54M titanium alloy</td>
<td>Moukrane Dehmas*, Christophe Ramirez, Ali Idhi Ismail, Christine Gendarme, Elisabeth Auby-Gautier, Gérard Pouclanchon, Frédéric Rossi (France)</td>
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<tr>
<td>T9-S20-1</td>
<td>Investigation on the Dynamic Mechanical Properties of Ti-B25 High-Strength β Titanium Alloy</td>
<td>Wei Tan* (China)</td>
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<td>T9-S20-2</td>
<td>Effects of Mo segregation on Charpy absorbed energy in Ti-12Mo alloys</td>
<td>Satoshi Emura*, Xin Ji, Xiaohua Min, Koichi Tsuchiya (Japan)</td>
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<td>T9-S20-3</td>
<td>Microstructure and mechanical properties evolution of Ti-6242 alloy for high temperature structural application. Static and dynamic mechanical properties and effect of ageing</td>
<td>Bertrand Max*, Alexis Joël, Larignon Céline, Perusin Simon (France)</td>
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<tr>
<td>T9-S20-4</td>
<td>Machinability of cast titanium alloy Ti-6Al-4V with addition of boron</td>
<td>Stefan Cedergren, Robert Pederson* (Sweden)</td>
</tr>
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<td>T9-S20-5</td>
<td>Plastic strain localization during hot working and servicing of titanium alloys: on the effect of microstructure heterogeneity</td>
<td>Xueqi Jiang*, Xiaoguang Fan, Qi Li, Mei Zhan (China)</td>
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<tr>
<td>T9-S20-6</td>
<td>The influence of ternary and quaternary alloy additions on the superelastic behaviour of metastable Ti-Nb based alloys</td>
<td>Nick Jones*, Emma Hildyard, Leigh Connor (United Kingdom)</td>
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<tr>
<td>T9-S20-7</td>
<td>Diffusion wear mechanisms of WC-10%Co carbide tools during dry machining of Ti54M titanium alloy</td>
<td>Moukrane Dehmas*, Christophe Ramirez, Ali Idhi Ismail, Christine Gendarme, Elisabeth Auby-Gautier, Gérard Pouclanchon, Frédéric Rossi (France)</td>
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</table>

### Lunch in the exhibition area

### Industrial visits

- Registration mandatory - limited number of seats

### Gala Dinner - The Machines of Nantes Isle

- Registration mandatory: 80 € per participant
### Thursday, June 13th | 10:20-23:00

#### Room BC

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<tr>
<td>10:20</td>
<td>T2-S7-1</td>
<td>Hot salt stress-corrosion cracking on Ti 6246</td>
<td>Yitong Shi*, Sudha Joseph, Trevor Lindley, Edward Saunders, Rebecca Sandala, David Dye (United Kingdom)</td>
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<td>10:40</td>
<td>T2-S7-2</td>
<td>Evolution of mechanical properties of Ti6242S alloy after oxidation in air at 560°C: influence of solid salts deposits</td>
<td>Ioana Popa*, Maxime Berthaud, Clément Ciszak, Jean-Michel Brossard, Daniel Monceau, Sébastien Chevalier (France)</td>
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<td>11:00</td>
<td>T2-S7-3</td>
<td>Mechanisms of oxidation of pure and Si-segregated α-Ti surfaces</td>
<td>Somesh Kumar Bhattacharya, Ryoji Sahara*, Kyosuke Ueda, Takayuki Narushima (Japan)</td>
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<tr>
<td>11:20</td>
<td>T2-S7-4</td>
<td>High temperature oxidation and mechanical behavior of Beta21s and Ti6242s Ti-based alloys</td>
<td>Aurelie Vande Put*, Carole Thouron, Philippe Emile, Raphaelle Peraldi, Benjamin Dod, Daniel Monceau (France)</td>
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<tr>
<td>11:40</td>
<td>T2-S7-5</td>
<td>Superior oxidation resistance titanium alloy ARCONIC-THORTM for aerospace applications</td>
<td>Sesh A Tamirisakandala*, Ernie Crist, Fusheng Sun, Matthew Dahar (United States)</td>
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<tr>
<td>12:00</td>
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<td>Lunch in the exhibition area</td>
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<td>13:30</td>
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<td>Afternoon Industrial visits</td>
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#### Room I

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<th>Time</th>
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<tr>
<td>10:20</td>
<td>T10-S10-1</td>
<td>The effect of plastic deformation on martensite decomposition process in Ti-6Al-4V alloy</td>
<td>Maciej Motyka*, Anna Baran-Sadleja, Waldemar Zioja, Jan Sieniawski (Poland)</td>
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<td>10:40</td>
<td>T10-S10-2</td>
<td>Thermo-hydrogen treatment of TiAl6V4 for improved mechanical properties via structure gradients</td>
<td>Christopher Schmidt*, Peter Schmidt, Hans-Jürgen Christ (Germany)</td>
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<td>11:00</td>
<td>T10-S10-3</td>
<td>Development of ultra-fine grain microstructures in titanium alloys via phase transformation assisted recrystallization</td>
<td>Alexander Edwards*, Philippe Vermaut, Ivan Guillot, Frederic Prima (France)</td>
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<td>11:20</td>
<td>T10-S10-4</td>
<td>Preparation of ultrafine grained titanium alloy bar by weak mannesmann cross-rolling process</td>
<td>Zhe Zhang*, Dong Liu, Yanhu Yang, Jianguo Wang, Yuhua Pang, Hai Wang, Fuxiang Zhang, Haidong Rao (China)</td>
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<tr>
<td>11:40</td>
<td>T2-S7-1</td>
<td>Superior oxidation resistance titanium alloy ARCONIC-THORTM for aerospace applications</td>
<td>Sesh A Tamirisakandala*, Ernie Crist, Fusheng Sun, Matthew Dahar (United States)</td>
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**Gala Dinner | The Machines of Nantes Isle**
Registration mandatory: 80 € per participant

**Industrial visits** - Registration mandatory - limited number of seats
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<tr>
<td><strong>T6-S3</strong></td>
<td><strong>T5-S2</strong></td>
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<tr>
<td><strong>Intermetallics and MMCs</strong></td>
<td><strong>Extraction and Powder Production</strong></td>
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<td><strong>Mechanical properties of MMCs</strong></td>
<td><strong>Powder II</strong></td>
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**T6-S3-1** Research on transverse tension of SiC fiber reinforced TC17 composites  
Yumin Wang*, Xu Zhang, Qing Yang, Guoxing Zhang, Lina Yang, Ying Wu, Rui Yang (China)

**T5-S2-1** Production of spherical titanium alloy powders used in additive manufacturing from titanium scrap  
Taras Yanko*, Viktor Brener, Olexandr Ovchinnikov (Russia)

**T6-S3-2** Improvement of high temperature performance of titanium matrix composites by constructing hierarchical microstructure  
Lujun Huang*, Lin Geng (China)

**T5-S2-2** The production of titanium powder via hydrogen reduction of titanium tetrachloride by inductively coupled rf plasma  
Sunghun Park*, Soyeong Lee, Hoseong Lee, Hosang Son (Republic of Korea)

**T6-S3-3** Multi-scale reinforcements stimulated dynamic recrystallization and mechanical behavior of as-extruded titanium matrix composites  
Pei Kun Qiu*, Yuanfei Han, Guangfa Huang, Jianwen Le, Weijie Lu (China)

**T5-S2-3** A method for the production of titanium-tantalum alloys powders via the electrolytic reduction of their respective oxides using the metalysis-FFC process  

**T6-S3-4** Deformation and fracture behavior of in-situ Ti composites reinforced with TiB/nano-sized particles  
Yuanfei Han*, Weijie Lu (China)

**T5-S2-4** Production of Ti-based powders for metal injection molding and additive manufacturing by induction plasma technology. An alternative to powder manufacturing by atomization and a possibility to recycle materials  
Romain Vert*, Rémy Pontone, Richard Dolbec (France)

**T6-S3-5** Effect of processing route on microstructure and mechanical properties of a Ti-3Al-2.5V/TiB composite  
Gourdet Sophie, Ludovic Ropars, Moukrane Dehmas, Elisabeth Aeb-y-Gautier, David Tricker, Dominique Schuster, Abrivard Guillaume* (France)

Lunch in the exhibition area

**Industrial visits** - Registration mandatory - limited number of seats

**Gala Dinner | The Machines of Nantes Isle**  
Registration mandatory: 80 € per participant
**FRIDAY, JUNE 14TH | 08:00 - 10:20**

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<td>08:00</td>
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| 08:20 | T1-S10-2 Status of aeronautical applications for wirefeed direct energy deposition additive manufacturing in Ti-6Al-4V alloys  
Philippe Emile* (France) |
| 08:40 | T1-S10-3 Topology optimisation of an aircraft nosewheel fork for production in Ti6Al4V by the Aeroswift high speed laser powder bed fusion machine  
Francis Monaheng*, Willie Du Preez, Nico Kotze, Marius Vermeulen (South Africa) |
| 09:00 | T1-S10-4 Repairing Ti-6Al-4V aeronautical components with DED additive manufacturing  
Jean-Yves Hascoet, Matthieu Rauch*, Manjaiah M (France) |
| 09:20 | T1-S10-5 Qualifying Ti-6Al-4V parts produced by electron beam melting for spatial applications  
Ludovic Ropars*, Fanny Rozière, Timothée Bassien-Capsa, Patrick Champion, Sylvain Pauleau, Pierre-Adrien Frocha, Corentin Marie (France) |
| 09:40 | T1-S10-6 Twenty years of titanium additive manufacturing  
Craig A Brice*, Peter Collins (United States) |

**AUDITORIUM 450**

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| 08:20 | T10-S12-1 Why anti-twinning can be formed in metastable β titanium alloys? A case study in Ti-24Nb-4Zr-8Sn superelastic single crystal  
Emmanuel Bertrand*, Philippe Castany, Yang Yang, Edern Menou, Laurent Couturier, Yulin Hao, Thierry Gloriant (France) |
| 08:40 | T10-S12-2 Strengthening of Ti-6Al-7Nb alloy by high-pressure torsion processing  
Maki Ashida, Takao Hanawa*, Peng Chen, Yusuke Tsutsumi, Zenji Horita (Japan) |
| 09:00 | T10-S12-3 Stress-induced martensitic transformation during the tensile and compressive tests of metastable titanium alloy Ti-7333 at room temperature  
Jiangkun Fan*, Puyi Gao, Luyao Tang, Bin Tang, Hongchao Kou, Jinshan Li (China) |
| 09:20 | T10-S12-4 Strain induced phase transformation in Ti-15Mo β alloy  
Xiaoming Wang*, Bernard Li (United States) |
| 09:40 | T10-S12-5 Direct observation of stress-induced transformations in metastable β Ti-10V-2Fe-3Al alloy  
Frank Niessen*, Mitchell Nancarrow, Gilberto Casillas Garcia, Ahmed A. Saleh, Elena Pereloma (Australia) |
| 10:00 | T10-S12-6 Microstructural evolutions and mechanical properties during long-term ageing of the Ti-17 titanium alloy  
Nicolas Maury*, Moukrame Dehmas, Claude Archambault-Mirguet, Jérôme Delbosse, Elisabeth Aeby-Gautier (France) |

10:00 Coffee break in the exhibition area
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<th>An analysis of thermo-mechanical fatigue crack growth in the titanium alloy Ti-6246</th>
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<td>Jennie Palmer*, Jonathan Jones, Mark Whittaker, Steve Williams (United Kingdom)</td>
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<td>T2-S8-3</td>
<td>Integrated micromechanical approaches to understand dwell fatigue: from titanium alpha-beta microstructures to disc thermal alleviation</td>
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<td>Zebang Zheng, Zhen Zhang, Ben Britton, Fionn Dunne* (United Kingdom)</td>
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<tr>
<td>T2-S8-4</td>
<td>Integrated Micromechanical Approaches to Understand Dwell Fatigue: Building constitutive understanding with micropillar understandings</td>
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<td>Terry Jun, Zhen Zhang, Fionn Dunne, Ben Britton* (United Kingdom)</td>
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<td>T2-S8-5</td>
<td>Normal and dwell fatigue behavior of a near alpha titanium alloy – IMI 834</td>
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<td>K U Yazar*, Anit Bhattacharjee, Satyam Suwas (India)</td>
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<tr>
<td>T2-S8-6</td>
<td>The effect of machining and subsurface microstructure on the fatigue performance of Ti-6246</td>
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<td>Daniel Suarez-Fernandez*, Bradley Wynne, Pete Crawford, Katharine Fox, Martin Jackson (United Kingdom)</td>
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| T9-S27-1 | Assessment of predominant microstructural features controlling the 3D short crack growth in Ti-6Al-4V |
|          | Meysam Hassanipour*, Shinta Watanabe, Han Li, Kyosuke Hiranaka, Hiroki Toda, Aihisa Takeuchi, Kentaro Uesugi (Japan) |
| T9-S27-2 | Multiscale mechanical behavior related to confined deformation in pure titanium |
|          | Runguang Li*, Xiaojing Liu, Wenjun Liu, Yang Ren, Yan-Dong Wang (China) |
| T9-S27-3 | Investigation of α-Ti plastic anisotropy under thermomechanical loadings: temperature influence on deformation mechanisms |
|          | Kajou Emmanuel Agbibi*, Jamal Fajouri, Baptiste Girault, David Gloaguen, Saurabh Kobra, Joe Kelleher, Winfried Kockelmann, Thomas Buslaps, Agnieszka Poulain (France) |
| T9-S27-4 | Deformation mechanisms and effect of oxygen addition on mechanical properties of Ti-7.5Mo alloy with α′ martensite |
|          | Xin Ji*, Ivan Gutierrez-Urrutia, Satoshi Emura, Koichi Tsuchiya (Japan) |
| T9-S27-5 | Coexistence of multi-deformation modes in beta Ti alloys with improved yielding strength and ductility |
|          | Guanfang Chen*, Jinyong Zhang, Yangyang Fu, Zheng Chen, Fan Sun, Frédéric Prima (China) |
| T9-S27-6 | Local fatigue crack propagation resistance relevant to microstructure uniquely developed in a friction stirred Ti-6Al-4V alloy joint |
|          | Masakazu Okazaki*, Milton Muzvidziwa, Satoshi Hirano (Japan) |

Coffee break in the exhibition area
### FRIDAY, JUNE 14TH | 08:00 - 10:20

#### ROOM BC

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker/Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:00</td>
<td>**T1-S12</td>
<td>Additive and near netshape manufacturing</td>
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<tr>
<td></td>
<td>Biomedical applications</td>
<td></td>
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<tr>
<td>08:20</td>
<td><strong>T6-S4-1</strong></td>
<td>High-temperature deformation behavior of Ti22Al25Nb</td>
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<tr>
<td></td>
<td>Jingli Zhang*, Jinping Wu, Yuanyuan Luo, Dizi Guo, Fan Yang, Shengze Zhao (China)</td>
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<tr>
<td>08:40</td>
<td><strong>T1-S12-2</strong></td>
<td>Qualification of customised medical implants produced by Ti6Al4V(ELI) additive manufacturing</td>
</tr>
<tr>
<td></td>
<td>Wilhelm Bouwer Du Preez* (South Africa)</td>
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<tr>
<td>08:40</td>
<td><strong>T6-S4-2</strong></td>
<td>New insights on the high temperature deformation behaviors of the lamellar structures in high Nb containing TiAl alloys</td>
</tr>
<tr>
<td></td>
<td>Lin Song*, Li Wang, Michael Oehring, Xingguo Hu, Uwe Lorenz, Florian Pyczak, Tiebang Zhang (Germany)</td>
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<tr>
<td>09:00</td>
<td><strong>T1-S12-3</strong></td>
<td>3D printing by robocasting and characterisation of Ti-6Al-4V architectured porous scaffolds for biomedical applications</td>
</tr>
<tr>
<td></td>
<td>Xavier Boulinat*, Marion Coffigniez, Laurent Gremillard (France)</td>
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<tr>
<td>09:00</td>
<td><strong>T6-S4-3</strong></td>
<td>Fatigue crack threshold and growth in γ-TiAl</td>
</tr>
<tr>
<td></td>
<td>Claire Trant*, David Dye, Trevor Lindley, Nigel Martin, Mark Dixon, Edward Saunders (United Kingdom)</td>
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<tr>
<td>09:20</td>
<td><strong>T1-S12-4</strong></td>
<td>Development of biomedical beta Ti alloys by additive manufacturing from Mixture powder</td>
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<tr>
<td></td>
<td>Mitsuharu Todai*, Risa Kato, Takeshi Nagase, Takayoshi Nakano (Japan)</td>
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<tr>
<td>09:20</td>
<td><strong>T6-S4-4</strong></td>
<td>Research on the microstructure and mechanical properties of the extruded multi-phase TiAl alloy</td>
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<tr>
<td></td>
<td>Fan Gao*, Zhen Li (China)</td>
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<tr>
<td>09:40</td>
<td><strong>T1-S12-5</strong></td>
<td>Microstructure and mechanical properties of beta type Ti 24Nb 4Zr 8Sn cellular structures fabricated by electron beam melting</td>
</tr>
<tr>
<td></td>
<td>Shujun Li*, Wentao Hou, Hongxia Yang, Yulin Hao, Rui Yang (China)</td>
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<tr>
<td>09:40</td>
<td><strong>T6-S4-5</strong></td>
<td>Effect of Mo, V and Zr on the microstructures and micro-hardness of Ti2AINb alloys</td>
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<tr>
<td></td>
<td>Yujun Du*, Xianghong Liu, Jinshan Li, Wenzhong Luo, Yongsheng He, Xiaohua Zhao, Kaixuan Wang (China)</td>
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<tr>
<td>10:00</td>
<td><strong>T1-S12-6</strong></td>
<td>Compressive and fatigue behavior of functionally graded Ti 6Al 4V meshes fabricated by additive manufacturing</td>
</tr>
<tr>
<td></td>
<td>Shuo Zhao*, Guang Yang, Shujun Li (China)</td>
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<tr>
<td>10:00</td>
<td><strong>T6-S4-6</strong></td>
<td>Microstructural evolution and mechanical properties of a newly developed Ti2AINb based alloy</td>
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<tr>
<td></td>
<td>Yongsheng He*, Wenzhong Luo, Tao He, Yujun Du, Xianghong Liu, Rui Hu, Kaixuan Wang (China)</td>
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#### ROOM G

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<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker/Details</th>
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<tbody>
<tr>
<td>08:00</td>
<td><strong>T6-S4</strong></td>
<td>Intermetallics and MMCs Mechanical properties of intermetallics II</td>
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<tr>
<td>08:00</td>
<td><strong>T5-S3</strong></td>
<td>Extraction and Powder Production</td>
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<tr>
<td></td>
<td><strong>T5-S3-1</strong></td>
<td>Extraction I</td>
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<tr>
<td>08:20</td>
<td><strong>T5-S3-2</strong></td>
<td>Intermetallics and MMCs Mechanical properties of intermetallics II</td>
</tr>
<tr>
<td></td>
<td><strong>T5-S3-3</strong></td>
<td>Intermetallics and MMCs Mechanical properties of intermetallics II</td>
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<tr>
<td>08:40</td>
<td><strong>T5-S3-4</strong></td>
<td>Extraction I</td>
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<tr>
<td></td>
<td><strong>T5-S3-5</strong></td>
<td>Intermetallics and MMCs Mechanical properties of intermetallics II</td>
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<tr>
<td>09:00</td>
<td><strong>T5-S3-6</strong></td>
<td>Extraction I</td>
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<td><strong>T5-S3-7</strong></td>
<td>Intermetallics and MMCs Mechanical properties of intermetallics II</td>
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<td>09:20</td>
<td><strong>T5-S3-8</strong></td>
<td>Extraction I</td>
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<td><strong>T5-S3-9</strong></td>
<td>Intermetallics and MMCs Mechanical properties of intermetallics II</td>
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<td>09:40</td>
<td><strong>T5-S3-10</strong></td>
<td>Extraction I</td>
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<td><strong>T5-S3-11</strong></td>
<td>Intermetallics and MMCs Mechanical properties of intermetallics II</td>
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<tr>
<td>10:00</td>
<td><strong>T5-S3-12</strong></td>
<td>Extraction I</td>
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<tr>
<td></td>
<td><strong>T5-S3-13</strong></td>
<td>Intermetallics and MMCs Mechanical properties of intermetallics II</td>
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</tbody>
</table>

10:00 10:20 Coffee break in the exhibition area
**ROOM H**

**T5-S3 | Extraction and Powder Production**

**Extraction I**

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**T5-S3-2** Smelting, refining, and recycling of titanium
*Toru H. Okabe*, Lingxin Kong, Takanari Ouchi (Japan)

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**T5-S3-3** Fabrication of porous metallic titanium by calcium vapor in-situ reduction of titanium oxides and vacuum sintering
*Baoqiang Xu*, Zhijun Wang, Guobo Yang, Jia Yang, Dachun Liu, Bin Yang (China)

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**T5-S3-4** Development of method for direct deoxidation of titanium using mixtures of magnesium chloride and rare-earth chlorides
*Takanari Ouchi*, Chenyi Zheng, Lingxin Kong, Takara Tanaka, Toru H. Okabe (Japan)

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**T5-S3-5** Effect of microstructure of surface layer in steel vessel used for sponge titanium manufacturing on Fe elution
*Mеiji Watanabe* ©Japan

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**T5-S3-6** Chemical reactions during reduction process of TiCl4 by Mg in actual production vessel
*Yosuke Inoue*, Masanori Yamaguchi (Japan)

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Coffee break in the exhibition area
### FRIDAY, JUNE 14TH | 10:20 - 13:30

**AUDITORIUM 800**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker and Details</th>
</tr>
</thead>
</table>
| 10:20  | T1-S11 | Additive and near netshape manufacturing  
Microstructure / Properties III |  
*Keynote lecture*  
Exploitation of field assisted sintering technology (FAST) for titanium alloys  
* Nicholas Weston (United Kingdom) |
| 10:40  |  |  |  
**T1-S11-3** Impact of process parameters and heat treatment on mechanical properties of  
Ti64 LBM  
* Pierre Bernard* (France) |
| 11:00  |  |  |  
**T1-S11-4** Micro-mechanical properties of the alpha prime martensite phase occurring in  
a Ti-6Al-4V alloy after various processing routes, including laser metal deposition  
* Jerome Tchuang Tchuindjang* (France) |
| 11:40  |  |  |  
**T1-S11-5** From the fatigue properties of Ti6Al4V produced by ALM selective laser  
melting process to the mechanical design of an aeronautical part  
* Francois Edy*, Viet-Duc Le, Claudia Biere, Monica Perez,  
Etienne Pessard, Franck Morel (France) |

**AUDITORIUM 450**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker and Details</th>
</tr>
</thead>
</table>
| 10:40  | T10-S13 | Microstructure evolution  
Strain induced transformations II |  
**T10-S13-1** Phase transformations in Ti15Mo alloy subjected to equal channel angular pressing  
* Miloš Janeček*, Kristína Bartha, Anna Terynková, Jozef Veselý,  
Peter Minárik, Irina Semenova, Veronika Polyakova, Josef Stráský (Czech Republic) |
| 11:00  |  |  |  
**T10-S13-2** Microstructure-twinning relations in beta-Ti alloys  
* Ivan Gutierrez-Urrutia*, Xin Ji, Satoshi Emura, Koichi Tsuchiya (Japan) |
| 11:40  |  |  |  
**T10-S13-3** Phase field modeling of deformation twinning in beta-metastable titanium alloys  
* Juba Hamma*, Benoît Appolaire, Yann Le Bouar, Alphonse Finel (France) |
| 12:00  |  |  |  
Lunch in the exhibition area |
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Speaker(s)</th>
<th>Location</th>
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<tbody>
<tr>
<td>10:20</td>
<td>T1-S13</td>
<td>High temperature oxidation of Ti-6Al-4V alloy fabricated by additive manufacturing. Influence on mechanical properties</td>
<td>Antoine Casadebaigt*, Daniel Monceau, Jonathan Hugues (France)</td>
<td>ROOM BC</td>
</tr>
<tr>
<td>10:40</td>
<td>T1-S13</td>
<td>Titanium Ta6V alloy reinforced by addition of nano YTTRIA stabilized zirconia fabricated by selective additive manufacturing: microstructure and mechanical investigations</td>
<td>Amine Hattal*, Madjid Djemai, Guy Dirras, Brigitte Bacroix (France)</td>
<td>ROOM BC</td>
</tr>
<tr>
<td>10:40</td>
<td>T5-S4-1</td>
<td>Synthetic rutile derived titanium alloy development utilising the metalysis process and field assisted sintering technology</td>
<td>Simon John Graham*, Lyndsey Benson, Martin Jackson (United Kingdom)</td>
<td>ROOM G</td>
</tr>
<tr>
<td>10:40</td>
<td>T6-S5-1</td>
<td>Evaluation of interfacial characteristics in dissimilar joining of TiAl alloy and SCM440 by friction welding</td>
<td>In-Chul Choi*, Ki-Young Kim, Kazuhiro Ito, Myung-Hoon Oh (Republic of Korea)</td>
<td>ROOM G</td>
</tr>
<tr>
<td>10:40</td>
<td>T6-S5-2</td>
<td>Study on the thermal stability and tailored of the retained B2 phase in the Ti-42Al-5Mn alloy</td>
<td>Xiaobing Li*, Hongjian Tang, Weiwei Xing, Bo Chen, Yingche Ma, Kui Liu (China)</td>
<td>ROOM G</td>
</tr>
<tr>
<td>10:40</td>
<td>T6-S5-3</td>
<td>High-temperature oxidation resistant coatings for TiAl-based alloys by electrochemical plating</td>
<td>Tiffany Calascibetta*, Willi Peters, Alexander Donchev, Klaus-Michael Mangold, Mathias Goletz, Michael Schütze, Marjorie Cavarroc, Stéphane Knittel, Daniel Monceau (Germany)</td>
<td>ROOM G</td>
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<tr>
<td>10:40</td>
<td>T5-S4-2</td>
<td>Titaniuim Production via Titanium Sulfide</td>
<td>Ryosuke O. Suzuki*, Yuta Yashima, Nobuyoshi Suzuki, Shungo Natsui, Tatsuya Kikuchi (Japan)</td>
<td>ROOM G</td>
</tr>
<tr>
<td>11:20</td>
<td>T1-S13</td>
<td>Linear friction welding process development and applications in aerospace industry</td>
<td>Yasmine Sadallah* (France)</td>
<td>ROOM BC</td>
</tr>
<tr>
<td>11:20</td>
<td>T6-S5-4</td>
<td>High-temperature oxidation of TiAl-Nb-Cr-Si(-W) alloys</td>
<td>Soonyong Park*, Seongeun Park, Geunsoo Bae, Jaeok Jung (Republic of Korea)</td>
<td>ROOM G</td>
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</table>

11:40 Lunch in the exhibition area
ROOM H

**T5-S4** Extraction and Powder Production

**T5-S4-1** Synthetic rutile derived titanium alloy development utilising the metalysis process and field assisted sintering technology
Simon John Graham*, Lyndsey Benson, Martin Jackson (United Kingdom)

**T5-S4-2** Titanium Production via Titanium Sulfide
Ryosuke O. Suzuki*, Yuta Yashima, Nobuyoshi Suzuki, Shungo Natsui, Tatsuya Kikuchi (Japan)

**T5-S4-3** Manufacturing of high quality titanium thin foil by electrodeposition route
Daisuke Suzuki*, Haruka Yamamoto, Matsuhide Horikawa, Hideki Fujii (Japan)

**T5-S4-4** Thermodynamic investigation of Titanium hydride formation from reduction of titanium (IV) chloride with magnesium hydride in presence of hydrogen atmosphere
Mohammad Rezae Ardani*, Ahmad Fauzi Mohd Noor, Sheikh Abdul Rezan Sheikh, Abdul Rahman Mohamed, Huoi Ling Lee, Ismail Ibrahim (Malaysia)

**T5-S4-5** Study of the signal response of melt pool acquisition system for AlSi7Mg0.6 in selective laser melting
Pinky Yadav*, Eric Lacoste, Emile Le Guen, Corrine Arvieu, Olivier Rigo (Belgium)

Lunch in the exhibition area
KEYNOTE AND PLENARY SPEAKERS

KEYNOTE LECTURES

CHINA

NEAR NETSHAPE FORMING OF TI-AL BASED INTERMETALLIC ALLOYS
Ruy Yang, Yuyou Cui, Lei Xu
Institute of Metal Research, Chinese Academy of Sciences, Shenyang

Rui Yang obtained his BSc from the Department of Mechanical Engineering, Wuhan Institute of Hydraulic and Electric Engineering in 1984 and read for his MSc in metallic materials at the Institute of Metal Research (IMR), CAS. He obtained a PhD in materials science from the University of Cambridge in 1992 and was elected a Title A Research Fellow of St John’s College Cambridge 1992-1995. He has been the head of Titanium Alloys Division of IMR since 1997. Under his leadership the laboratory developed a number of titanium based materials, including gamma and orthorhombic titanium aluminides, silicon carbide fibre reinforced titanium matrix composite, low modulus superelastic titanium alloys, as well as near net shape processes of powder metallurgy and investment casting. He has authored and coauthored more than 200 peer-reviewed papers and held more than 30 Chinese patents and 2 US patents. He was a recipient of the Applied Science Award from Zhou Guang Zhao Foundation (2010) and of the Metallurgy and Materials Technology Award from Ho-Leung Ho-Lee Foundation (2011).

SCIENTIFIC AND TECHNOLOGICAL ADVANCES ON ADDITIVE MANUFACTURING OF HIGH-PERFORMANCE LARGE CRITICAL TITANIUM STRUCTURAL COMPONENTS FOR THE AEROSPACE INDUSTRIES
The National Engineering Laboratory of Additive Manufacturing for Large Metallic Components (NELAM), Beihang University, Beijing

Dr. Huaming Wang, academician of the Chinese Academy of Engineering and expert of metal additive manufacturing, is a professor of materials processing and manufacturing in the School of Materials Science and Engineering of Beihang University (BUAA) since 1995. He is the founder and director of the National Engineering Laboratory of Additive Manufacturing for Large Metallic Components (NELAM-LMC) and the National Research and Application Center of Laser Additive Manufacturing for Defense Industries (NRAC-LAMDI). He received his Bachelor’s degree on Foundry Technology from Sichuan Institute of Technology in 1983, Master’s degree on Mechanical Engineering from Xian Jiaotong University in 1986 and Ph.D on Mining Mechanical Engineering from China University of Mining and Technology (Beijing) in 1989. He conducted his post-doctorate research on Rapid Solidification Laser Materials Processing and Unidirectional Solidification Processing of Single-Crystal Ni-Base Superalloy in the Institute of Metal Research of the Chinese Academy of Sciences in 1989-1992. Prof. Wang was granted a Humboldt Research Fellowship by the Alexander von Humboldt Foundation in 1992 and compiled his research on Laser Surface Engineering in the Institute of Metals Science and Technology, University of Erlangen-Nurnberg, Germany in 1992-1994. He has over 30 years’ research experience on rapid solidification materials processing and manufacturing and is a leading expert of Laser Additive Manufacturing for Large Metallic Components and Laser Cladding for Advanced Multi-functional Tribological Coatings and published over 200 referred papers in international journals. He was granted the First Grade Award of the National Technology Invention Award in 2012 owing to his pioneering achievements on laser additive manufacturing of large titanium aircraft structural components. He won the First Grade Award of the Natural Science Award of the Ministry of Education in 2014 owing to his innovative basic research on tribological behaviors of laser clad multi-components transition metal silicides coatings wear resistant coatings. Prof. Wang was awarded the “National May 1st Labor Medal” in 2005, the Aeronautical Golden Medal in 2013 and was elected as an Academician of the Chinese Academy of Engineering in 2015.
CIS

SCIENTIFIC AND TECHNOLOGICAL ADVANCES ON ADDITIVE MANUFACTURING OF HIGH-PERFORMANCE LARGE CRITICAL TITANIUM STRUCTURAL COMPONENTS FOR THE AEROSPACE INDUSTRIES
The National Engineering Laboratory of Additive Manufacturing for Large Metallic Components (NELAM), Beihang University, Beijing

Dr. Huaming Wang, academician of the Chinese Academy of Engineering and expert of metal additive manufacturing, is a professor of materials processing and manufacturing in the School of Materials Science and Engineering of Beihang University (BUAA) since 1995. He is the founder and director of the National Engineering Laboratory of Additive Manufacturing for Large Metallic Components (NELAM-LMC) and the National Research and Application Center of Laser Additive Manufacturing for Defense Industries (NRAC-LAMDI).


He has over 30 years' research experience on rapid solidification materials processing and manufacturing and is a leading expert of Laser Additive Manufacturing for Large Metallic Components and Laser Cladding for Advanced Multi-functional Tribological Coatings and published over 200 referred papers in international journals. He was granted the First Grade Award of the National Technology Invention Award in 2012 owing to his pioneering achievements on laser additive manufacturing of large titanium aircraft structural components. He won the First Grade Award of the Natural Science Award of the Ministry of Education in 2014 owing to his innovative basic research on tribological behaviors of laser clad multi-components transition metal silicides coatings wear resistant coatings. Prof. Wang was awarded the “National May 1st Labor Medal” in 2005, the Aeronautical Golden Medal in 2013 and was elected as an Academician of the Chinese Academy of Engineering in 2015.

PROGRESS IN WROUGHT PROCESSING OF TITANIUM
M.O. Leder, V.A. Kropotov, A.V. Volkov, D. A. Piskunov
VSMPO-AVISMA Corporation, Parkovaya St. 1, Verkhnaya Salda, Sverdlovsk region

Mikhail O. Leder, Science and Technology Director of VSMPO-AVISMA Corporation. He has over 28 years of experience in titanium industry. He started as ordinary research engineer and was gradually promoted to the position of the Head of Research and Development Center. In the Corporation, he supervises all processes related to the development, implementation and follow-up of melting, forging, heat treating and machining practices employed during production of ingots, billets, slabs, bars, plates, sheets, tubes, rings, die forgings from a variety of titanium alloys, ranging from CP titanium to high strength near beta alloys and intermetallics.
FRANCE

ADVANCES AND BREAKTHROUGHS IN TITANIUM FORGINGS FOR CRITICAL STRUCTURAL PARTS
Jacques Lecadet
R&D Director ERAMET Alloys

Research and Development ERAMET Alloys & Aubert&Duval, since 2013 Elaboration Director, Aubert & Duval (2005 - 2013) In charge of production facilities: Steel shops, VIM and remelting facilities for special steels and superalloys

DESIGN AND DEVELOPMENT OF STRAIN-TRANSFORMABLE TITANIUM ALLOYS FOR IMPROVED RESISTANCE/DUCTILITY TRADE-OFF
Frédéric Prima
Materials Science in Chimie Paristech

Frédéric Prima is Professor of Materials Science in Chimie Paristech, Paris, Fr. He graduated from Institut National des Sciences Appliquées (INSA Lyon) in 1995 and obtained his PhD in Materials Science in INSA Rennes, in 2000. He worked as a postdoctoral fellow in Oxford University Materials Department (UK) from 2000 to 2003. The work of his research group in mainly dedicated to the investigation of phase transformations and microstructures/properties relationships in titanium-based alloys. Recently, his recent research has been focused on the design strategies and the development of new high-performance titanium alloys for aerospace applications, in close collaboration with Timet/PCC and SAFRAN. His group works, as well, in the development of beta alloys for biomedical applications. He has published over 100 journal articles, 5 patents and participated to more than 120 national and international conferences (16 as invited speaker).
GERMANY

INNOVATIVE AEROSPACE AND SPACE STRUCTURES MADE BY ADDITIVE MANUFACTURING OF TITANIUM ALLOYS AND TITANIUM ALUMINIDES
C. Leyens1,2, F. Brückner2,3, E. López2, A. Seidel2, M. Riede2 and A. Marquardt1,2

1 TU Dresden, Institute of Materials Science, Germany
2 Fraunhofer Institute for Material and Beam Technology IWS, Dresden, Germany
3 Luleå University of Technology, Sweden

Born in 1967, Dr. Christoph Leyens studied physical metallurgy and materials technology at RWTH Aachen, Germany, where he earned his diploma in 1993 and his Ph.D. in 1997. He is currently a full professor for materials science at TU Dresden, Germany, director of the Fraunhofer Institute of Materials and Beam Technology IWS, Dresden, Germany, and an adjunct professor at RMIT University, Melbourne, Australia. Dr. Leyens has covered a wide range of research topics with a focus on high temperature and light weight materials, functional materials, laser processing, surface technology, coatings and additive manufacturing. He has published more than 200 papers, seven books and holds eleven patents. Dr. Leyens is initiator and coordinator the R&D project »AGENT-3D«, Europe’s largest single project on AM. Out of a total of 120 partners, the consortium comprises more than 100 companies, aiming at the industrial implementation of AM as an enabling technology for advanced manufacturing.

TITANIUM ALUMINIDES – STATUS OF THE PRODUCTION OF INGOTS, SEMI-FINISHED PRODUCTS AND POWDERS
Volker Güther and Melissa Allen

Volker Güther is the Head of R&D of the Business Unit Titanium Aluminides of AMG Titanium Alloys and Coatings (legally GfE Metalle und Materialien GmbH, Nuremberg, Germany). After graduation in solid state physics in 1983, he started his industrial career in the R&D on powder metallurgy of high melting refractory metals. In 1992 he joint GfE as the R&D Manager. His work is focused on the metallurgy of specialty alloys and intermetallic materials. The achievements on the development of metal hydrides for hydrogen storage applications have been recognized by the Paul-Grünfeld-Award in 2004. In 2015 he received the Intermetallics Award for his substantial contributions particularly in the industrialization of manufacturing technologies for Titanium Aluminides.
JAPAN

RECENT ACTIVITIES OF TITANIUM RESEARCH AND DEVELOPMENT IN JAPAN
Kazuhiro Takahashi, Kenichi Mori, Hidenori Takebe
Steel Research Laboratories, Nippon Steel & Sumitomo Metal Corporation

Dr. Kazuhiro Takahashi is a chief researcher in the Steel Research Laboratories of Nippon Steel & Sumitomo Metal Corporation. He obtained M.S. in Science and Engineering from Tokyo University of Science graduate school in 1991, and a PhD in Engineering from Kanazawa University in 2016. He has been carried out research and development on titanium and its applications in Nippon Steel & Sumitomo Metal Corporation since 1991. His current research interests include microstructure control, surface modification and application technologies for automobile parts and architectural material and so on in titanium and titanium alloys.

RECENT STUDIES AND DEVELOPMENTS CONCERNING TITANIUM BIOMATERIALS
Masahiko Ikeda
Department of Chemistry and Materials Engineering, Kansai University

Masahiko Ikeda is a professor in the Department of Chemistry and Materials Engineering, Kansai University. He obtained a Masters in Engineering from Kansai University graduate school in 1981, and a PhD in Engineering in 1991. From 1979 to 1986, he was employed at a private company, and carried out research and development. In 1986, he moved to Kansai University as a Research Associate. From 1986 to 2002, he was a Research Associate, a lecturer and then an Associate Professor. In 1995, he was an Academic Visitor in the Materials Department at Imperial College, London. His research interests have been in the area of phase transformations in beta titanium alloys. Since 2002, he has been a Professor at Kansai University. His recent research is focused on the development of cost-efficient beta titanium alloys for health care and medical applications.
UNITED KINGDOM

ENVIRONMENTAL EFFECTS ON FATIGUE AND SCC
David Dye
Imperial College London

David Dye is a Professor of Metallurgy in the Department of Materials at Imperial College, London, UK. He mostly works on the fatigue mechanisms, micromechanics and design of titanium and nickel/cobalt superalloys. In Ti he collaborates with Rolls-Royce and Timet/PCC, working on alloy and microstructure design and on the micromechanics of fatigue, particularly as it pertains to in-service performance. Prior to moving to Imperial in 2003, he worked at the neutron spectroscopy facility in Chalk River, Canada. His undergraduate degree and PhD were from Cambridge University, on the weldability of nickel-base superalloys. He has received a number of awards for his work and has published over 100 journal articles. He was an EPSRC Leadership Fellow, 2010-15 and is presently a Royal Society Industry Fellow.

EXPLOITATION OF FIELD ASSISTED SINTERING TECHNOLOGY (FAST) FOR TITANIUM ALLOYS
Nicholas Weston
Department of Materials Science and Engineering, The University of Sheffield

Nicholas Weston is a Research Associate in the Department of Materials Science and Engineering at the University of Sheffield. He obtained an MEng in Aerospace Engineering in 2011 and a PhD in Metallurgy in 2017, both from the University of Sheffield. He became a Research Associate in 2016 working as part of the Sheffield Titanium Alloy Research group. His principal research interest is the solid-state downstream processing of titanium alloy powders and particulates, to produce low-cost titanium alloy components. Research undertaken during his PhD developed FAST-forge; a cost effective processing route that can turn titanium alloy powder feedstock into a near net shape component with forged properties in two steps. The first step uses FAST to produce a shaped pre-form billet, which can then be forged in one operation to near net shape in the second step. His post doctoral focus has involved two collaborative research and development projects part-funded by InnovateUK, where he has worked with industrial partners to further develop the FAST-forge process for aerospace and automotive applications.
UNITED STATES

A NEW PROCESS FOR PRODUCTION OF LOW COST TI POWDER AND THE SINTERING OF TI ALLOY POWDER TO ACHIEVE WROUGHT-LIKE MICROSTRUCTURE AND MECHANICAL PROPERTIES

Z. Zak Fang
University of Utah

Professor of Metallurgical Engineering at the University of Utah since 2002. He worked in the industry for ten years prior to coming back to academia. Obtained his Ph.D degree from the University of Alabama at Birmingham. MS and BS from the University of Science and Technology Beijing. Expertise in metallic materials, metallurgy, and manufacturing including extractive metallurgy of Ti, sintering and mechanical properties of Ti, and low-cost production of Ti metal powders. He is the author or co-author of over 360 technical publications. He is the inventor or co-inventor of 50 US patents. Fellow of the National Academy of Inventors and Fellow of American Society of Metals.

OPPORTUNITIES AND CHALLENGES FOR THE INDUSTRIAL TITANIUM MARKET

Rob Henson
Manager, Business Development, VSMPO Tirus US

Hershel Robert (Rob) Henson began his career working in corrosion research at Teledyne Wah Chang under the direction of Dr. Te Lin Yau in the early 1980s. Henson holds a Bachelor of Science Degree in Business Management from Linfield College and has authored and co-authored many publications. Henson led the development of Ti-45Nb as an ignition resistant titanium alloy for gold pressure oxidation application and was a co-inventor of titanium alloy Ti-35Zr-10Nb. Henson continues to work in business development and sales of titanium products for industrial application. He is currently Chairman of the International Titanium Association Industrial Applications Committee and a member of NACE active in the TEG 120X Reactive Metal Forum.
PLENARY LECTURES

CHINA

CURRENT SITUATION OF TITANIUM RESEARCH, DEVELOPMENTS AND APPLICATIONS IN CHINA
Hui Chang, Lian Zhou
Institute of Advanced Materials/College of Materials Science and Engineering, Nanjing Tech University, Nanjing, Jiangsu

Hui Chang obtained his BSc from the Department of Materials Science and Engineering, Central South University in 1988 and read for his MSc in Northeast University for Materials Science in 1997. He obtained the PhD in materials science from the Northwestern Polytechnical University and Institut National Polytechnique de Lorraine in 2006 and 2010, respectively. He has been engaged in the research and development on titanium alloys and fabrication technologies for more than 26 years. Now, his mainly interesting is focused on titanium phase transformation kinetics, microstructure evolutions and low-cost technologies (short-processing). And also, some new manufacture technologies for high-quality and lower cost titanium powder is been under developed by his team. He has authored and coauthored more than 150 peer-reviewed papers and held more than 20 Chinese patents related titanium alloys and manufacture technologies. He is now the vice director college of materials science and engineering in Nanjing Tech University and became an International Organization Committee (IOC) of world conference on titanium since Ti-2015 conference.

CIS

NEW RESEARCH AND DEVELOPMENT OF TITANIUM PRODUCTION AND APPLICATION IN THE CIS
Andrey Alexandrov
Interstate Association Titan

Andrey Alexandrov has been the General Director of the Interstate Association «Titan» since 2001. After graduating from the Moscow Institute of Steel and Alloys worked as a Researcher at the All-Russian Institute of light alloys (VILS). Later he worked in trading companies specializing in the production and international trade of titanium products. In 1997, he returned to VILS as Head of the Titanium Department. The main scientific works are related to melting of titanium and its alloys, production of alloys with shape memory, development of new equipment, engineering, marketing. Scientific degree is Ph.D Engineering. Have a big international trade experience, management and organizational work in titanium industry. While heading Interstate Association Titan, number of members has increased from 19 to 61. Association has developed into authoritative industry organization with wide business and information contacts in CIS countries and more than 15 countries abroad. Association is full CIS representative in worldwide titanium organizations. Since 2002 he is the editor-in-Chief of the scientific and technical journal «Titanium».
FRANCE

TITANIUM IN FRANCE: RESEARCH ACTIVITIES, INDUSTRIAL DEVELOPMENTS AND APPLICATIONS
Pierre-François Louvigné
The French Titanium Association

Pierre-François Louvigné is in charge of the titanium market survey for the French government since 2001. He was graduated in physics, material sciences and MBA. He spent more than 20 years in the French defense procurement agency where he has been involved in the development of titanium alloys for military applications and took different responsibilities in armament programs.

GERMANY

DEVELOPMENTS IN TITANIUM RESEARCH AND APPLICATIONS IN GERMANY
Carsten Siemers1, Christian Stöcker2
1Technische Universität Braunschweig, Braunschweig, Germany
2ARCONIC Engineered Structures, TITAL GmbH, Bestwig, Germany

Carsten Siemers started his research career on the “Machinability of Titanium Alloys” in Braunschweig in 2000. In 2005, he secured a permanent position as a “Senior Research Scientist” at the University of Technology (TU) Braunschweig. Currently, he heads the Titanium Research Group of the Institute for Materials at the TU Braunschweig. Research in his group is focussed on the development of advanced Titanium alloys for several fields of applications like the aerospace, the medical and the automotive industries. This includes the identification of alloy compositions and alloy production as well as alloy characterisation and testing in laboratory and industrial scale. In 2012 Carsten Siemers has been elected chairman of the Titanium Technical Experts’ Committee of the German Materials Association (DGM), i.e. a liaison person between Academia and Titanium industry in Germany.
JAPAN

RECENT ACTIVITIES OF TITANIUM RESEARCH AND DEVELOPMENT IN JAPAN

Takayuki Narushima
Department of Materials Processing, Tohoku University

Dr. Takayuki Narushima received B.S., M.S., and Ph.D. degrees in Engineering from Tohoku University, Japan, in 1985, 1987, and 1994, respectively. He joined the Department of Metallurgy at Tohoku University as a Research Associate from 1987 to 1994 and as an Associate Professor from 1994 to 2004. He was a Professor at the Tohoku University Biomedical Engineering Research Organization (TUBERO), and since 2007, he has been a Professor in the Department of Materials Processing at Tohoku University. From 1998 to 1999, he served as a Research Fellow at the University of California, Berkeley (Monbusyo Fellowship Program). His current research interests on titanium and its alloys include surface modification for biomedical applications, experimental and theoretical study on thermal oxidation, and melting process.

UNITED KINGDOM

TITANIUM ALLOY RESEARCH DEVELOPMENTS IN THE UNITED KINGDOM

Martin Jackson
Department of Materials Science and Engineering, The University of Sheffield

Martin Jackson is currently Reader in Metals Processing at the Univ. Sheffield, United Kingdom. He graduated with a First Class MEng in Materials Science and Engineering from the Univ. Sheffield in 1997. He worked at Rolls-Royce as a graduate trainee before studying his PhD at the Royal School of Mines, Imperial College London. Dr Jackson was awarded the IOM3 Titanium prize in 2003 and a Royal Academy of Engineering Research Fellowship (2005-2010) to develop solid state processes for low cost titanium. He is co-director (with Brad Wynne) of the Sheffield Titanium Alloy Research (STAR) research group who work with a broad range of companies in the aerospace, automotive and defence sectors on solid state processing of titanium and service performance of components. Dr Jackson first presented at the World Titanium conference in Hamburg (Ti-2003).

UNITED STATES

RECENT ADVANCES IN TITANIUM TECHNOLOGY IN THE UNITED STATES

Don Li
Engineering Manager, R&D, Arconic Engineered Structures

Extensive technical management experience of managing engineers and technical projects; Strong technical expertise in metal processing. Recipient of RTI Individual Achievement Award Have been providing critical support to different Business Units of Arconic.
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*Jian Huang, Anping Dong, Hui Xing (China)*
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Since its creation, Jules Verne Institute has been developing industrial research dedicated to advanced manufacturing technologies in 5 strategic industries: aeronautics, shipbuilding, automotive, energy and advanced manufacturing equipment.

LCMA S.A.  
BOOTH N° 38
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Address: 140, Z.I. Scheleck 1 - L-3225 Bettembourg - Luxemburg 
Phone: +352 26 55 43-29 - E-mail: thomas@lcma.lu 
Website: www.lcma.lu
L.C.M.A. S.A. is the 100% European manufacturer/distributor of a wide range of titanium alloy semi-finished products with a strategic location in Luxembourg! Titanium bars, ingots, tubes, tsheets/plates and wire belong to the product portfolio of LCMA.

METAfensch  
BOOTH N° 9
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Address: 109 rue de Thionville - 57270 Uckange - France 
Phone: +33 (0)3 82 80 13 80 - E-mail: info@metafensch.fr 
Website: www.metafensch.fr
MetaFensch’s aim is to accompany our industrial partners in their R&D projects on Ti melting, recycling and powders. Based in France, we use a semi-industrial scale PAM-CHR and a fully industrial EIGA atomizer. Our partner, IRT M2P, carries out studies on surface treatments including after AM.
NAVAL GROUP

Contact person: Julia GUILLERM
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E-mail: jguillerm.exterieur@naval-group.com
Website: www.naval-group.com

Naval Group is a European leader in naval defence. The group designs, builds and supports submarines and surface ships. It also supplies services to shipyards and naval bases. In addition, the group offers a wide range of marine renewable energy solutions.

PRODWAYS RAPID ADDITIVE FORGING

Contact person: Gilles DUVAL
Address: 1 rue chappe - 78130 Les Mureaux - France
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Website: http://prodways-raf.com/

Prodways produces machines to print large scale parts, in titanium or hard alloy, for competitively priced structural components. The proprietary Rapid Additive Forging (RAF) Technology leads to mechanical characteristic at the level of forged parts.

SCIAKY, INC.

Contact person: John O’HARA
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Website: www.sciaky.com

Sciaky designs and supplies its production-ready Electron Beam Additive Manufacturing (EBAM) systems to 3D print large scale structural or critical forge-like parts. Widely used by major aerospace & defense players, such as Lockheed Martin & Airbus, EBAM is recognized as the most mature technology.

SHAANXI TIAN CHENG AEROSPACE CO., LTD

Contact person: Ariel ZHOU
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Website: www.tcae.com

TC AEROSPACE, one of the leading titanium alloy manufacturing company in the field of Aerospace Rod and Coil, as well as Plate and Sheet. We provides competitive, safe and reliable services and high quality products for customers.
SINO-EURO MATERIALS TECHNOLOGIES OF XI’AN

Contact person: YU CAO  
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THE FRENCH TITANIUM ASSOCIATION

Contact person: Tugdual BASSI  
Phone: +33 (0)7 64 41 88 84 - E-mail: tugdual.bassi@titane.asso.fr  
Website: www.titane.asso.fr

The French Titanium Association brings together French-speaking companies and laboratories with an interest in Titanium and titanium alloys and their uses. The association relies on industrial and academic experts to brainstorm on new fields of applications and/or on proposals to improve the alloys and their micro-structures when specific limitations in use are encountered.

THERMO-CALC SOFTWARE AB

Contact person: Therese GUSTAFSSON  
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Phone: +46 854595930 - E-mail: info@thermocalc.com  
Website: www.thermocalc.com

The company Thermo-Calc Software AB was founded in 1997 as an offspring from KTH, Stockholm, Sweden. The mission of Thermo-Calc Software is to develop and supply software, databases and services for technical calculations involving thermodynamics, diffusion and precipitation.

TIMET SAVOIE

Contact person: Yvon MILLET  
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Website: www.timet.com

TIMET is a founding member of the titanium industry, one of the world’s largest titanium producers. We make sponge; melt ingot/slab; and produce mill products. TIMET’s fully integrated supply chain, dedicated research facilities, and decades of experience make us the partner of choice for titanium.
TIPRO INTERNATIONAL CO., LTD

Contact person: Terry HUANG
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Website: www.tipro-international.com/

Tipro is an ISO 9001 & AS 9100D certified group manufacturer, with over 20-year's experience in manufacturing of titanium welding wires and bars, Titanium sheet and plate, fasteners and custom parts. Our proven development process enables us to always meet and exceed customer expectations.

VOESTALPINE BÖHLER BLECHE GMBH & CO KG

Contact person: Clemens VICHYTL
Address: Böhler-Gasse 1 - 8680 Mürzzuschlag - Austria
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Website: www.voestalpine.com/bohler-bleche

voestalpine BÖHLER Bleche is the only Titanium producing European rolling mill CP Titanium Grade 1 – 4 and alloyed Titanium Grade 5 are being offered and produced according state of the art standards and for applications in industrial, medical and aerospace applications.

VSMPO-AVISMA CORPORATION

Address: 1. Parkovaya St - Sverdlovsk Region - 624760 Verknaya Salda - Russia
Phone: +41216415500 - E-mail: office@tirus-sa.ch

VSMPO-AVISMA Corporation is the world largest titanium producer, fully vertically integrated, from titanium sponge to all types of mill products, die-forgings and finished parts, including large machining facilities.

WESTERN SUPERCONDUCTING TECHNOLOGIES CO. LTD.

Contact person: WANG SHAOPENG
Address: No.12, Mingguang Road, Economic&Technology Development Zone - 710018 Xi’an - China
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Website: www.c-wst.com

Western Superconducting Technologies Co., Ltd (WST) is an integrated and professional producer of titanium alloy forgings, bars, rods, wires and profiles used for aerospace, medical, automotive and critical industries. WST own VAR furnace, high speed forging press, precision forging production line.
ZIROM TITANIUM

Contact person: Gabriela STAN
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Phone: +40 246 216 666 - E-mail: info@zirom-titanium.com
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ZIROM is a high-end producer of ingots of various alloys in 2 diameters: 470 - 480mm & 570 - 580mm in 2VAR, 3VAR or EBCH-1+2VAR.
We are committed to deliver best quality, we observe the highest manufacturing standards in our industry, while also being one of the few recycling capacities in Europe.
SOCIAL EVENTS

A TAILOR MADE SOCIAL PROGRAM TO ENHANCE YOUR NETWORKING EXPERIENCE.

**WELCOME RECEPTION | CASTLE OF THE DUKE OF BRITTANY**
MONDAY, JUNE 10, 2019 | 18:30

We invite you to celebrate together the opening of the conference in this famous place of Nantes. Set in the historic heart of Nantes, the “Château des ducs de Bretagne” is the city’s most important historic building. Don’t miss this perfect occasion to gather together with the worldwide community of titanium.

*Free access to all registered participants and exhibitors*

**GALA DINNER | THE MACHINES OF NANTES ISLE**
THURSDAY, JUNE 13, 2019 | 20:00

The Ti-2019 Gala Dinner is not to be missed! Taking place at “Les Machines de l’Île de Nantes”, the Dinner is a unique occasion to discover the Galerie, a living space showcasing a veritable bestiary of machines. It is the only place where you’ll find Jules Verne’s “Invented Worlds,” the mechanical universe of Leonardo da Vinci, and Nantes’ industrial history, all on the exceptional site of the city's former shipyards.

*Registration mandatory: 80 € per participant*

Sponsored by
INDUSTRIAL VISITS

Visits to industrial sites are organised on Thursday, June 13, afternoon. Registration is mandatory - limited number of seats

INDUSTRIAL VISIT 1 | AIRBUS

**Airbus** is the global leading commercial aircraft manufacturer with the most modern, comprehensive and efficient family of airliners, ranging in capacity from 100 to more than 600 seats. Airbus has sold over 19,300 aircraft.

Specialised in the manufacture of centre wing boxes, air inlets and radomes, Nantes has acquired advanced expertise in the use of composite materials and the machining of large-scale, complex, aluminium alloy parts.

INDUSTRIAL VISIT 2 | ARIES MANUFACTURING

**Aries Manufacturing** is Aries Alliance international business brand dedicated to the production of complex parts for leading players in the aerospace industry. Part of Aries Alliance group global strategy, Aries Manufacturing benefits from the same expertise chain that allowed the group to stand out in the machine manufacturing field: simulation, design and manufacturing.

Through high temperature processes like hot forming and superplastic forming, Aries Manufacturing specializes in the forming of titanium alloys, Ti-6Al-4V or Ti-6242. These alloys are widely used in commercial and military aircraft, mainly for high temperature applications like in nacelles, pylons, engines or in corrosive environment. Aries Manufacturing controls the entire process, from simulation, development of dies, up to delivery of finished parts to its partners.

INDUSTRIAL VISIT 3 | NAVAL GROUP

**Naval Group** is a European leader in naval defence. As an international high-tech company, Naval Group uses its extraordinary know-how, unique industrial resources and capacity to arrange innovative strategic partnerships to meet its customers’ requirements. The group designs, builds and supports submarines and surface ships. It also supplies services to shipyards and naval bases. In addition, the group offers a wide range of marine renewable energy solutions. Attentive to corporate social responsibility, Naval Group adheres to the United Nations Global Compact. The group reports revenues of €3.6 billion and has a workforce of 14,860 (data for 2018).
USEFUL INFORMATION

ABSTRACT BOOK
Electronic version only available on conference website: www.titanium2019.com

AIRPORT INFORMATION
Nantes Atlantique Airport: www.nantes.aeroport.fr

CERTIFICATE OF ATTENDANCE
All registered participants will receive a certificate of attendance upon arrival.

CLOAKROOM (DURING CONFERENCE HOURS)
Cloakroom is located at the main entrance next to the conference welcome desk and it is free for charge to all participants.

CLIMATE AND CLOTHING
Summers are usually warm and comfortable, averaging 20°C during the day. Evenings can be cool, so it’s best to pack a light jacket or sweater.

CONGRESS LANGUAGE
The congress language is English, no translation provided.

CURRENCY
France adopted the euro currency in 2002. These notes and coins can therefore be used in any country belonging to the euro zone.
EUR 1 is divided into 100 cents.

Notes: EUR 5, 10, 20, 50, 100, 200 and 500.
Coins: 1, 2, 5, 10, 20 and 50 cents; EUR 1 and 2.

ELECTRICITY
In France the norm is 220 volts, with a frequency of 50 Hz. Voltage and sockets vary from country to country and so an adapter may be necessary.
For more information: www.worldstandards.eu/electricity/plug-voltage-by-country/

EMERGENCY NUMBERS
The pan-European emergency number 112 can be called for any type of emergency and an operator will direct you to the appropriate French department. Alternatively, specific services can be reached as follows:
Fire brigade: 18
Police: 17
Accident and Emergency: 15
FOOD AND BEVERAGES
Coffee breaks and Lunches are included in the registration fee and will be served in the exhibition area (ground floor) in allocated time.

HEALTH SERVICES
Chemists (called pharmacie in France) are usually open straight through from 8am to 8pm. They take it in turns to close on Sundays and also sometimes on Mondays. When a chemist is closed, the addresses of the nearest duty chemists are displayed on the door. A few chemists remain open late and even all night.

In the French yellow pages (PagesJaunes), you will find a more comprehensive listing of doctors under "Medecins generalistes" and "Medecins specialistes" under their speciality, e.g: dermatology, cardiology.... Alternatively, ask at your place of accommodation for the closest doctors. You may wish to ask the consultation fees in advance, prior to making an appointment, in order to avoid issues concerning payment for services provided.

In case of emergency, the pan-European emergency number 112 can be called for any type of emergency. Or alternatively dial `15` for Accident and Emergency.

For further information on the French Medical system you can visit the "assurance maladie" website http://www.ameli.fr (website in French).

FULLY INTEGRATED
FROM SPONGE TO MILL PRODUCTS
INSURANCE AND LIABILITY DISCLAIMER
Ti-2019 organisers and MCI France cannot be held liable for any hindrance or disruption of Conference proceedings arising from political, social, health or economic events or any other unforeseen incidents beyond their control. The conference cancellation conditions shall apply in any case. Registration of a participant entails acceptance of the cancellation conditions. It is recommended that participants obtain adequate cover for travel, health, accident and cancellation insurance before they depart from their countries.

Ti-2019 organisers and MCI France as organisers will accept no liability for personal injuries sustained by or for loss or damage to property belonging to Conference participants and accompanying persons either during or as a result of the Conference or during all tours and events.

LOST AND FOUND
Lost & Found service is available at the welcome desk during opening hours.

NATIONAL AND INTERNATIONAL CALLS
The France country code 33 will allow you to call France from another country (use the international access code 00 prior to dialing 33), followed by an area code.
All French numbers have 10 digits and begin with 0. The prefix for Nantes numbers is 02 and mobile numbers start with 06.
0 800 and 0 804, 0 805, 30 00, 31 44, 36 55 all denote a free service. Other special telephone numbers have specific tariffs from land lines.

Contact your mobile phone operator who will confirm whether or not your mobile is compatible with the French network and also explain how you will be charged for calls received from your own country or that you make while abroad (local and international calls).

METRIC MEASURES
The system of measurement used in France is the metric system, and temperatures are expressed in degrees Centigrade.

It’s worth noting too, that in France decimals are indicated by a comma and not a point, as in English-speaking countries.

REGISTRATION OPENING HOURS
Monday, June 10: 16:00-19:00
Tuesday, June 11: 07:30-19:30
Wednesday, June 12: 07:30-19:30
Thursday, June 13: 07:30-14:00
Friday, June 14: 07:30-14:00
TIME ZONE
Nantes is in the Central European Time Zone. You can see Nantes’ time in relation to most cities on the globe by visiting www.TimeAndDate.com

TIPPING
In France, prices shown include tax and service. However, if the service has been particularly good, you may wish to leave a tip in order to show your appreciation. As a general rule, the amount is 5 to 10% of the total bill.

INTERNET
Free Wi-Fi internet connection is available in all conference spaces.

NETWORK: Ti-2019
PASSWORD: TITANIUM2019

PRODUCTS
ZIROM produces ingots of various alloys in 2 diameters: 470 - 480mm & 570 - 580mm in 2VAR, 3VAR or EBCH-1+2VAR. The ingots from Titanium sponge incl master alloys are produced in the VAR furnace of the company. Amongst others, we produce / test / certify our products according to AMS 2631 (up to AA), AMS 2154 (up to AA), AMS6931, AMST9047, AMS 4928, AMS 4981, BS 3TA11, WL 3.7164, ISO 5832-3, ASTM F 136, ASTM B 348 + 367 + 381 + 977.

CERTIFICATES
• AS9100D / EN9100:2018
• ISO9001:2015
• ISO14001:2015
• OHSAS18001:2007
• ISO17025:2005

• NORSOK M650 (for CP Gr. 2 and Ti6-4 Gr. 5)
We are aiming to get NADCAP-certifications for our laboratory and our non-destructive testing by the end of 2019 latest.
NOTES

TITANIUM:  
BAR / COIL / PLATE / SHEET  
FOR AEROSPACE STRUCTURES AND FASTENERS
VSMPO-AVISMA Corporation is the world’s largest titanium producer, fully vertically integrated, from titanium sponge to all types of mill products, die-forgings and finished parts, including large machining facilities. The Corporation is a key strategic partner and approved supplier of leading companies in high-technology sectors like aerospace, aero-engines, power generation industry, chemical engineering, ship building as well as the medical industry. VSMPO-AVISMA holds more than 300 international quality certifications for quality management system, processes and products.

In order to offer a best-in-class logistics and commercial service to its customers worldwide, VSMPO-AVISMA has an integrated sales and distribution network, named VSMPO-Tirus. With warehouses located in United States, Germany, England and China, the Tirus network distributes ingot, forgings, slab, sheet, plate, bar, and billet to the aerospace, medical, and consumer products industries. In North America, the VSMPO-Tirus US company also manufactures small diameter bar and coil for medical and aerospace fastener applications.
Titanium for demanding markets
from ingots to finished parts

Fully integrated titanium solution

www.aubertduval.com