

# Swedish Arena for AM of Metals Online Conference

11-12 January 2021

January, 11 – Morning session

9:00- 9:10 Greetings and Introduction

## KEYNOTE SPEAKERS PRESENTATIONS

9:10-9:40

Prof. Olaf Diegel, University of Auckland, New Zealand

Title: "Design for AM – the key to the industrialization of additive manufacturing"

9:40-10:10

Prof. Akihiko Chiba, Tohoku University, Japan

Title: "Avoiding "smoke" in electron beam additive manufacturing"

*10 min break*

## ONLINE ORAL POSTER PRESENTATIONS

10:20 – 10:25

Claes Fredriksson, Jonas Olsson and Johny Haraldsson

"Sustainability Assessment of Additive Manufacturing with Superalloy 718"

Department of Engineering Science, University West, Trollhättan

10:25 – 10:30

Bilen Emek Abali

"Infill ratio caused substructure and effects on the mechanical response"

Uppsala University, Sweden

10:30 – 10:35

Danial Molavitabrizi and Mahmoud Mousavi

"Design of Metamaterials for Additive Manufacturing"

Uppsala University, Sweden

10:35 – 10:40

Dmitri Riabov, Eduard Hryha, Sven Bengtsson

"Effect of Atomization on the Surface-Oxide Composition of 316L Powders for AM"

Chalmers University of Technology, Höganäs AB

10:40 – 10:45

Ahmad Raza, Eduard Hryha

"Powder degradation in laser powder bed fusion process"

Chalmers University of Technology, Sweden

10:45 – 10:50

Camille Pauzon<sup>1</sup>, Pierre Forêt<sup>2</sup>, Eduard Hryha<sup>1</sup>

"Atmospheres for laser powder bed fusion"

<sup>1</sup>Chalmers University of Technology, Sweden, <sup>2</sup>Linde GmbH, Unterschleissheim, Germany

10:50 – 10:55

Durga Ananthanarayanan, Greta Lindwall

"Materials design for grain refinement using inoculants in additive manufacturing"

KTH Royal Institute of Technology, Stockholm, Sweden

10:55 – 11:05

Collecting questions for discussion

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*15 min break*

**11:20 – 11:25**

Sri Bala Aditya Malladi, Zhuoer Chen, Shen Guo, Lars Nyborg  
“Additive Manufacturing of CoCrNi Medium Entropy Alloy”  
Chalmers University of Technology, Sweden

**11:25 – 11:30**

Inga Goetz<sup>1</sup>, Ulf Jansson<sup>1</sup>, Jochen Schneider<sup>2</sup>  
“ZrN – bulk metallic glass composite formation under laser processing”  
<sup>1</sup>Uppsala University, <sup>2</sup>RWTH Aachen University

**11:30 – 11:35**

Hanna Nilsson Åhman<sup>1,2</sup>, Pelle Mellin<sup>1</sup>, Cecilia Persson<sup>2</sup>  
“Corrosion behaviour of Mg-alloy WE43 processed by PBF-LB”  
<sup>1</sup>Swerim AB, <sup>2</sup>Uppsala University

**11:35 – 11:40**

Jithin James Marattukalam, Lisa Larsson, Björgvin Hjörvarsson, Natalia Ferraz, Cecilia Persson  
“Biocompatibility of an additively manufactured zirconium-based bulk metallic glass: Effect of surface roughness on osteoblastic cell response”  
Uppsala University, Sweden

**11:40 – 11:45**

Simon Tidén<sup>1</sup>, Mamoun Taher<sup>2</sup>, Ulf Jansson<sup>1</sup>  
“The effect of functionalized graphene coated copper powder in laser powder bed fusion”  
<sup>1</sup>Uppsala University, <sup>2</sup>Graphmatech AB

**11:45 – 12:00**

Questions and discussion

*5 min break*

**12:05 – 12:15**

Best poster award and Closing the session

**12:15 – 13:15**

Break-out rooms and discussions after the conference

# Swedish Arena for AM of Metals Online Conference

11-12 January 2021

January, 12 – Afternoon session at 13:00

13:00 – 13:10 Introduction to the second day of the conference

## KEYNOTE SPEAKERS PRESENTATIONS

**13:10-13:40**

Prof. Carolin Körner, Central Institute for New Materials and Process Technology ZMP and at Neue Materialien Fürth GmbH, Fürth, Germany

Title: "Powder bed and electron beam based additive manufacturing"

**13:40-14:10**

Prof. Iain Todd, The University of Sheffield, UK

Title: "Artificial Intelligence and Machine learning in Additive Manufacturing"

*10 min break*

## ONLINE ORAL POSTER PRESENTATIONS

**14:20 – 14:25**

Amir Baghdadchi<sup>1</sup>, Vahid A Hosseini<sup>1</sup>, Maria Asuncion Valiente Bermejo<sup>1</sup>, Björn Axelsson<sup>2</sup>, Ebrahim Harati<sup>3</sup>, Mats Högstöm<sup>1</sup>, Leif Karlsson<sup>1</sup>

"Additive Manufacturing of Duplex Stainless Steel by Laser Metal Deposition with Wire"

<sup>1</sup>Department of Engineering Science, University West, 461 86 Trollhättan, Sweden, <sup>2</sup>Alfa Laval Tumba AB, 147 80 Tumba, Sweden, <sup>3</sup>ITW Welding AB, 433 25 Partille, Sweden

**14:25 – 14:30**

Rasmus Gunnerek and William Hearn

"Influence of layer thickness on the processability and productivity of low alloy steel"

Chalmers University of Technology, Department of Industrial and Materials Science, CAM2

**14:30 – 14:35**

William Hearn

"L-PBF Processing of Low Alloy Steels"

Chalmers University of Technology – CAM2

**14:35 – 14:40**

Stefan Roos, Lars-Erik Rännar

"Process window for electron beam melting of 316LN stainless steel"

Sports Tech Research Centre, Department of Quality Management and Mechanical Engineering, Mid Sweden University, Östersund, Sweden

**14:40 – 14:45**

Susanne Lewin<sup>1</sup>, Ingmar Fleps<sup>2</sup>, Jonas Åberg<sup>1</sup>, Stephen J. Ferguson<sup>2</sup>, Håkan Engqvist<sup>1</sup>, Caroline Öhman-Mägi<sup>1</sup>, Benedikt Helgason<sup>2</sup>, Cecilia Persson<sup>1</sup>

"Computational and experimental assessment of additively manufactured mesh-type Ti6Al4V structures for cranial implants"

<sup>1</sup>Uppsala University, Uppsala, Sweden; <sup>2</sup>Institute for Biomechanics, ETH Zurich, Switzerland

**14:45 – 14:50**

Dunyong Deng, Ru Lin Peng, Johan Moverare

"A comparison study of the dwell-fatigue behaviors of additive and conventional IN718: The role of dislocation substructure on the cracking behavior"

Linköping University

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**14:50 – 14:55**

Magnus Kahlin<sup>1,2</sup>, Hans Ansell<sup>1,2</sup>, Johan Moverare<sup>2</sup>

“Improved fatigue strength of AM Ti6Al4V by surface post-processing”

Saab AB<sup>1</sup>, Linköping University<sup>2</sup>

**14:55 – 15:00**

Collecting questions for discussion

*10 min break*

**15:10 – 15:15**

Jinghao Xu<sup>1</sup>, Hans Gruber<sup>2</sup>, Ru Lin Peng<sup>1</sup>, Johan Moverare<sup>1</sup>

A novel  $\gamma'$  strengthened nickel-based superalloy for laser powder bed fusion

<sup>1</sup>Linköping university, <sup>2</sup>Chalmers University of Technology

**15:15 – 15:20**

Cheng-Han Yu, Ru Lin Peng, Johan Moverare

“Effect of crystallographic texture on the anisotropic mechanical behaviour of additively manufactured Ni-based superalloy”

Linköping University

**15:20 – 15:25**

Prabhat Pant<sup>1</sup>, Sebastian Proper<sup>2</sup>, Vladimir Luzin<sup>3</sup>, Sören Sjöström<sup>1</sup>, Kjell Simonsson<sup>1</sup>, Johan Moverare<sup>1</sup>, Seyed Hosseini<sup>2</sup>, Victor Pacheco<sup>4</sup>, Ru Peng<sup>1</sup>

“Residual stresses in AM components: Print orientation study with neutron diffraction”

<sup>1</sup>Linköping University, Dept. of Management and Engineering, Linköping, Sweden, <sup>2</sup>RISE, Sweden, <sup>3</sup>ANSTO, Australia, <sup>4</sup>Uppsala University, Uppsala, Sweden

**15:25 – 15:30**

Victor Pacheco<sup>1</sup>, Jithin James Marattukalam<sup>2</sup>, Dennis Karlsson<sup>1</sup>, Luc Dessieux<sup>3,4</sup>, Tran Van Khanh<sup>5</sup>, Premysl Beran<sup>6,7</sup>, Ingo Manke<sup>5</sup>, Nikolay Kardjilov<sup>5</sup>, Henning Markötter<sup>5,8</sup>, Martin Sahlberg<sup>1</sup>, Robin Woracek<sup>6</sup>

“Revealing localized microstructure variations in additive manufacturing by neutron imaging”

<sup>1</sup>Department of Chemistry - Ångström Laboratory, Uppsala University, Box 523, SE-75120 Uppsala, Sweden; <sup>2</sup> Department of Physics, Materials Physics, Uppsala University, Box 530, SE-75121, Uppsala, Sweden; <sup>3</sup> Physics Department, University of Tennessee, Knoxville, Tennessee TN 37996-1200, USA; <sup>4</sup> Oak Ridge National Laboratory, Oak Ridge, Tennessee 37831, USA; <sup>5</sup> Helmholtz-Zentrum Berlin für Materialien und Energie (HZB), Hahn-Meitner-Platz 1, 14109 Berlin, Germany; <sup>6</sup> European Spallation Source ERIC, Box 176, 22100 Lund, Sweden; <sup>7</sup> Nuclear Physics Institute, Czech Academy of Sciences, 250 68, Řež, Czech Republic; <sup>8</sup> Bundesanstalt für Materialforschung und -Prüfung (BAM), Unter den Eichen 87, 12205 Berlin, Germany

**15:30 – 15:35**

Dennis Karlsson<sup>1</sup>, Mikael Kjellén<sup>2</sup>, Thomas Helander<sup>2</sup>, Martin Sahlberg<sup>1</sup>, Ulf Jansson<sup>1</sup>

“Manufacturing of an NiCr alloy by laser powder bed fusion for high temperature applications”

<sup>1</sup>Department of Chemistry – Ångström Laboratory, Uppsala University, Sweden

<sup>2</sup>Kanthal AB, Hallstahammar, Sweden

**15:35 – 15:50**

Questions and Discussions

*5 min break*

**15:50 – 16:00**

Best poster award and Closing the conference

**16:00 – 17:00**

Break-out rooms and discussions after the conference