

7-15-2018

Conference Program

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Office of Naval Research (retired)

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Program

Stress-Assisted Corrosion Damage V

July 15 - 20, 2018

Schloss Hernstein
Hernstein, Austria

Conference Chairs

A.K. Vasudevan
Office of Naval Research (retired)

Henry Holroyd
Luxfer, Inc.

Ronald Latanision
Massachusetts Institute of Technology / Exponent, Inc., USA



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ECI Technical Liaison for this conference: Ron Latanision

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Previous conferences in this series:

Stress Corrosion Cracking in Structural Materials at Ambient Temperatures

August 30 – September 4, 2009

Padova, Italy

Conference Chairs:

A.K. Vasudevan, ONR, USA

Henry Holroyd, Luxfer, Inc., UK

Richard Ricker, NIST, USA

Neville Moody, Sandia National Laboratories, USA

Environmental Damage in Structural Materials Under Static Cyclic Loads

at Ambient Temperatures II

August 14-19, 2011

Krakow, Poland

Conference Chairs:

A.K. Vasudevan, ONR, USA

Henry Holroyd, Luxfer, Inc., USA

Richard Ricker, NIST, USA

Neville Moody, Sandia National Laboratories, USA

Environmental Damage in Structural Materials Under Static/Cyclic Loads

at Ambient Temperatures III

June 15-20, 2014

Bergamo, Italy

Conference Chairs:

A.K. Vasudevan, ONR, USA

Henry Holroyd, Luxfer, Inc., USA

Richard Ricker, NIST, USA

Neville Moody, Sandia National Laboratories, USA

Environmental Damage in Structural Materials Under Static Load/Cyclic Loads

at Ambient Temperatures IV

May 29-June 3, 2016

Cork, Ireland

Conference Chairs:

A.K. Vasudevan, ONR, USA

Ronald Latanision, Exponent, Inc., USA

Henry Holroyd, Luxfer, Inc., USA

Neville Moody, Sandia National Laboratories, USA

The conference organizers gratefully acknowledge support from the U.S. Office of Naval Research.



Sunday, July 15, 2018

17:00 – 18:00	Conference Check-in
18:00 – 19:30	Reception in the historic castle (Wine tasting and cheeses)
19:30 – 21:00	Dinner

Notes

- Technical sessions will be in the Studio.
- Meals will be in the Panorama Restaurant.
- Audio, still photo and video recording by any device (e.g., camera, cell phones, laptops, PDAs, watches) is prohibited during the technical sessions, unless the author and ECI have granted prior permission.
- Speakers – Please leave about 10 minutes for questions and discussion.
- Speakers – Please ensure your talk adheres to your given time allotment. Talks that go over their allotment reduce time for valuable discussion and can disrupt the conference program.
- Turn your cellular telephones to vibrate or off during technical sessions.
- After the conference, ECI will send an updated participant list to all participants. Please check your listing now and if it needs updating, you may correct it at any time by logging into your ECI account.
- Please do not smoke at any conference functions.
- Please write your name in the front of this program booklet so it can be returned if misplaced.

Monday, July 16, 2018

- 07:30 – 09:00 Breakfast
- 09:00 – 09:15 **Welcome and Announcements**
A.K. Vasudevan
Henry Holroyd
Ronald Latanision, ECI Technical Liaison
- Session I: Special Topics**
Session Chair: Henry Holroyd, USA
- 09:15 – 10:00 **Extraction of EAC crack growth rates and stress intensity factors from slow strain rate tests data for 5xxx and 7xxx series aluminum alloys**
Henry Holroyd, Bolivar, USA
- 10:00 – 10:45 **Recommendations and rants regarding research on environmentally assisted cracking**
Stanley Lynch, Monash University, Australia
- 10:45 – 11:15 Coffee/tea/refreshments break
- 11:15 – 12:00 **Unified approach to crack growth and fracture**
Asuri Vasudevan, Office of Naval Research (retired), USA
- 12:15 – 13:30 Lunch
- 13:30 – 14:45 Tour/History of the historic Schloss Hernstein (accompanying persons invited)
Peter Glaser, Schloss Hernstein
- Session II: Special Topics (continued)**
Session Chair: James Burns, University of Virginia, USA
- 14:45 – 15:30 **Do corrosion pits eliminate the benefit of shot-peening?**
Alan Turnbull, National Physical Laboratory, UK
- 15:30 – 16:15 **Initiation and growth of corrosion fatigue cracks from corrosion pits using elasto-plastic notch analysis**
Asuri Vasudevan, Office of Naval Research (retired), USA
- 16:15 – 16:45 Coffee/tea/refreshments break
- 16:45 – 17:30 **When do small fatigue cracks propagate and when are they arrested?**
Stefanie Tschegg, BOKU, Austria
- 17:30 – 18:15 **Short crack tolerance under EAC conditions**
JTP Castro, PUC-Rio, Brazil
- 18:15 – 18:45 Discussion
- 19:30 – 20:30 Dinner
- 20:30 – 21:30 Social Hour

Tuesday, July 17, 2018

- 07:30 – 09:00 Breakfast
- Session III: Models and Experiments**
Session Chair: Michael Henthorne, USA
- 09:00 – 09:45 **Atomistic modeling of sustained FCG under realistic conditions**
Derek Warner, Cornell University, USA
- 09:45 – 10:30 **Intergranular corrosion and grain dissolution with peridynamics**
Florin Bobaru, University of Nebraska Lincoln, USA
- 10:30 – 11:00 Coffee/tea/refreshments break
- 11:00 – 11:45 **Building environmental history for naval aircraft**
William Nickerson, Office of Naval Research, USA
- 12:00 Pick up boxed lunches and maps of Vienna at the hotel reception
- 12:15 Coaches depart promptly for excursion to Vienna
(Free sightseeing time in Vienna for hop-on/hop-off buses, museums, etc.)
- 17:30 Meet at designated area to board return coach to Schloss Hernstein
- 19:00 – 20:00 Dinner
- 20:00 – 21:00 Social Hour

Wednesday, July 18, 2018

- 07:30 – 09:00 Breakfast
- Session IV: Hydrogen**
Session Chair: Tim Burnett, University of Manchester, UK
- 09:00 – 09:45 **Hydrogen effects on mechanical performance of nodular cast iron**
Hannu Hanninen, Aalto University, Finland
- 09:45 – 10:30 **Elucidating the mechanistic influence of strengthening precipitate morphology on hydrogen-assisted cracking in a Ni-Cr superalloy**
James Burns, University of Virginia, USA
- 10:30 – 11:15 Coffee/tea/refreshments break
- 11:15 – 12:00 **Ductile-Brittle Transition Temperature shift controlled by grain boundary decohesion and thermally activated energy and hydrogen GB embrittlement**
Jun Kameda, Retired, USA
- 12:00 – 12:45 **Effect of cyclic loading on hydrogen diffusion in low carbon steels**
Diego Pesenti Bucella, University of Bergamo, Italy
- 12:45 – 14:00 Lunch
- Session V: Corrosion**
Session Chair: Fritz Friedersdorf, LUNA, USA
- 14:00 – 14:45 **Effect of mechanical loading on the galvanic corrosion behavior of Mg-steel joint**
Kiran Solanki, Arizona State University, USA
- 14:45 – 15:30 **Role of microstructure and micromechanics in galvanic corrosion**
Michael Sangid, Purdue University, USA
- 15:30 – 16:15 Coffee/tea/refreshments break
- 16:15 – 17:00 **Effect of confined electrolyte volumes on galvanic corrosion kinetics in statically loaded materials**
Steven Policastro, US Naval Research Laboratory, USA
- 17:00 – 17:45 **Investigation of SCC of high strength aluminum alloys by means of slow strain rate test and cyclic anodic polarization in combination**
Monica Trueba, Independent Scientist, Italy
- 17:45 Technical Discussion
- 19:00 – 20:00 Dinner
- 20:00 – 21:00 Social Hour

Thursday, July 19, 2018

07:30 – 09:00

Breakfast

Session VI: Aluminum Alloys

Session Chair: Sarah E. Galyon Dorman, SAFE, Inc., USA

09:00 – 09:45

Initiation and final failure via environmentally assisted cracking in high strength aluminium

Tim Burnett, The University of Manchester, UK

09:45 – 10:30

Multiscale correlative characterization of environmentally assisted crack initiation, propagation and failure in a high strength AA5083 H131 alloy

V. C. Gudla, The University of Manchester, UK

10:30 – 11:15

Coffee/tea/refreshments break

11:15 – 12:00

Internal stress affecting environmental fatigue of 7075-T651 alloy

A.K. Vasudevan, TDA, Inc, USA

12:00 – 13:30

Lunch

Session VII: Fatigue

Session Chair: Stefanie Tschegg, BOKU, Austria

14:30 – 15:15

Understanding corrosion features and alloy microstructural effects on fatigue initiation of corroded AA7050-T7451 using data science

James Burns, University of Virginia, USA

15:15 – 16:00

Transition from small to large cracks in Ti-6Al-4V specimens

Emanuele Vincenzo Arcieri, University of Bergamo, Italy

16:00 – 16:45

Coffee/tea/refreshments break

16:45 – 17:30

A continuum mechanics model for fatigue life prediction with pre-corrosion and sequential corrosion fatigue

Nagaraja Iyer, TDA, Inc, USA

19:00 – 21:00

Conference Banquet

21:00 – 22:00

Social Hour

Friday July 20, 2018

07:30 – 09:00 Breakfast

Session VIII: Applications

Session Chair: Ronald Latanision, MIT/Exponent, Inc., USA

09:00 – 09:45 **4D microstructural and electrochemical characterization of dissimilar metal corrosion in naval structural Joints**
Sridhar Niverty, Arizona State University, USA

09:45 – 10:30 **Electrochemical and environmental assisted behavior of AA0224-T3 and AA7075-T6 welded by means of FSW**
Marina Cabrini, University of Bergamo, Italy

10:30 – 11:00 Coffee/tea/refreshments break

11:00 – 11:45 **Examination of Factors Influencing FCG in legacy aluminum alloys**
Sarah E. Galyon Dorman, SAFE, Inc., USA

11:45 – 12:30 **The influence of dynamic atmospheric conditions on EAC and corrosion fatigue**
Fritz Friedersdorf, Luna Innovations, USA

12:30 – 13:00 Feedback and Comments by Ron Latanision

13:00 Lunch and departures