***Preliminary Program***

***(May 10, 2023)***

# **SIXTH INTERNATIONAL WORKSHOP ON ENVIRONMENTALLY-ASSISTED CRACKING**

**July 16 - 21, 2023**

**Sheraton Reston Hotel**

**Washington, DC area, USA**

**Conference Chairs**

**A.K. Vasudevan**

Office of Naval Research (retired)

**R. Latanision**

Exponent, Inc

**H. Holroyd**

 Luxfer (retired)

**F. Friedersdorf**

Luna Labs USA, LLC



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**Engineering Conferences International**

**369 Lexington Avenue, 3rd Floor #389 - New York, NY 10017, USA**

**www.engconfintl.org –** **info@engconfintl.org**

**Sunday, July 16, 2023**

16:00 – 18:00 Conference check-in

18:00 – 18:30 Opening Reception

18:30 – 20:00 Dinner

**Monday, July 17, 2023**

07:30 – 08:30 Breakfast

**Session 1**

Chair: Dave Rusk, Naval Air Warfare Center Aircraft Division, USA

08:30 – 09:20 **Keynote**

 **Environment-induced crack initiation in metals - experimental studies**

 Henry Holroyd, Consultant, USA

09:20 – 09:50 **Relating material microstructural development and modeling damage**

 **parameters for crack initiation: comparison between air and hydrogen**

May Martin, National Institute of Standards and Technology, USA

09:50 – 10:20 **Effect of laser surface treatment on the corrosion and fatigue performance**

 **of aa5456-h116 alloys**

Rajaguru Jeyamohan, University of Virginia, USA

10:20 – 11:00 Coffee Break

11:00 – 11:30 **Characterizing environmentally assisted crack initiation and short crack**

 **growth**

Tim L. Burnett, The University of Manchester, United Kingdom

11:30 – 12:00 **Evaluation of chloride stress corrosion susceptibility of stainless steels**

 Earl Johns, Naval Nuclear Laboratory; Fluor Marine Propulsion, USA

12:00 – 13:30 Lunch

**Session 2**

Chair: Siddiq Qidwai, National Science Foundation, USA

13:30 – 14:20 **Keynote**

 **Modeling electrochemically assisted hydrogen adsorption on alloy**

 **surfaces**

 Chris Taylor, DNV GL and Ohio State University, USA

14:20 – 14:50 **Modeling stress corrosion cracking in stainless steel using phase field**

 **method**

 Mehdi Naderi, Technical Data Analysis, Inc ,USA

14:50 – 15:20 **Electrochemical-mechanical phase field model for electroplating process**

 Jung Ho Yang, Technical Data Analysis, Inc., USA

15:20 – 16:00 Coffee Break

16:00 – 16:30 **Dynamic hydrogen dilation model for hydrogen embrittlement**

 Michael McGuire, Carnegie Mellon University ret, USA

16:30 – 17:00 **Combined damage-fracture model for corrosion fatigue crack growth in 3D**

 **parts**

 Alexander Staroselsky, Raytheon Technologies Research Center, USA

 Dinner on your own

**Tuesday, July 18, 2023**

07:30 – 08:30 Breakfast

**Session 3**

Chair: TBD

08:30 – 09:00 **Advances in peridynamic modeling of environmentally- assisted cracking**

 Florin Bobaru, University of Nebraska-Lincoln, USA

09:00 – 09:30 **A computational framework for prediction of atmospheric**

Mehdi Amiri, George Mason University, USA

09:30 – 10:00 **Correlating nature of precipitates with environmental degradation in**

 **aluminum alloys**

 Ramasis Goswami, US Naval Research Laboratory, USA

10:00 – 10:30 Coffee Break

10:30 – 11:00 **Microstructural crack path prediction using graph theory**

 Veera Sundararaghavan, University of Michigan, USA

11:00 – 11:30 **The influence of additive manufacturing (3D printing) on susceptibility to**

 **environmentally induced fracture**

 Rick Ricker, University of Maryland, USA

11:30 – 12:00 **New aluminum alloy design**

 Asuri Vasudevan, Office of Naval Research (Retired), USA

12:00 – 13:00 Lunch

13:30 – 16:30 Excursion - National Air and Space Museum - The Steven F. Udvar-Hazy

 Center VA

**Wednesday, July 19, 2023**

07:30 – 08:30 Breakfast

**Session 4**

Chairs: Victor Rodriquez-Santiago, NAWCAD, USA

08:30 – 09:20 **Keynote**

 **Quantification of environmentally-assisted cracking mechanisms with high-**

 **resolution characterisation**

 Sergio Lozano-Perez, University of Oxford, United Kingdom

09:20 – 09:50 **Atomic mechanism of near threshold fatigue crack growth in vacuum as a**

 **basis for understanding environmental effects**

Derek Warner, Cornell University, USA

09:50 – 10:20 **Macro to micro approach toward the evaluation of the fracture** **energy**

 Dov Sherman, Tel-Aviv University; School of Mechanical Engineering,

 Israel

10:20 – 11:00 Coffee Break

11:00 – 11:30 **Electrochemical activities at the crack tip: A localized** **approach**

 Mehdi Amiri, George Mason University, USA

11:30 – 12:00 **Digital image correlation to study stress corrosion cracking of aluminum alloys**

Marina Cabrini, University of Bergamo, Italy

12:00 – 13:30 Lunch

**Session 5**

Chairs: Eric Lindgren, AF, USA

13:30 – 14:20 **Keynote**

 **Dynamic fracture in dealloying induced stress-corrosion cracking**

 Karl Sieradzki, Arizona State University, USA

14:20 – 14:50 **Surface stress in metals induced by organic monolayer films**

 Srinivasan Chandrasekar, Purdue University, USA

14:50 – 15:20 **Modeling hydrogen diffusion in precipitation hardened nickel alloy**

 Attilio Arcari, Naval Research Laboratory, USA

15:20 – 16:00 Coffee Break

16:00 – 16:30 **Electrochemical assessment of time-dependent diffusible hydrogen release**

 **in X65 pipeline steel samples charged with hydrogen**

 Alessandro Carrozza, University of Bergamo, Italy

16:30 – 17:00 **Development of a lifetime prediction model for evaluating the sensitivities**

 **of aiscc susceptibility in stainless-steel nuclear waste storage canisters**

 Sarah Blust, University of Virginia, USA

17:00 – 18:00 Poster Session / Reception

 Dinner on your own

**Thursday, July 20, 2023**

07:30 – 08:30 Breakfast

**Session 6**

Chairs: Earl Johns, Naval Nuclear Laboratory, USA

08:30 – 09:20 **Keynote**

 **Is laboratory testing of scc susceptibility fit for purpose?**

 Alan Turnbull, NPL, United Kingdom

09:20 – 09:50 **Environment-assisted fracture, my friend: The cutting of gummy metals**

Ronald M. Latanision, Exponent Inc.; Massachusetts Institute of Technology,

 USA

09:50 – 10:20 **Unusual behavior of long cracks at low dk: Marci effect**

 Daniel Kujawski, Western Michigan University, USA

10:20 – 11:00 Coffee Break

11:00 – 11:30 **The effect of atmospheric environment parameters on corrosion fatigue**

 **damage**

Sarah E. Galyon Dorman, SAFE Inc, USA

11:30 – 12:00 **Fatigue threshold Kmax,th affected by static threshold K1scc**

Asuri Vasudevan, TDA, Inc, USA

12:00 – 13:30 Lunch

**Session 7**

Chairs: TBD

13:30 – 14:00 **Environmental effects on the fatigue crack growth of low carbon nitrogen**

 **alloyed stainless steel**

M. Nani Babu, Metallurgy and Materials Group, Indira Gandhi Centre for

 Atomic Research, India

14:00 – 14:30 **Assessing the loading rate dependence of hydrogen environment-assisted**

 **cracking behavior in a wide-range of engineering alloys**

 Michael Roach, University of Virginia, USA

14:30 – 14:50 Coffee Break

14:50 – 15:20 **Fracture toughnes K1c affecting static threshold K1scc**

 Asuri Vasudevan, TDA, Inc., USA

15:20 – 15:50 **Atmospheric laboratory and outdoor testing of aluminum alloy**

 **environment assisted cracking**

 Fritz Friedersdorf, Luna Labs USA, LLC, USA

19:00 – 21:00 Conference Banquet

**Friday, July 21, 2023**

07:30 – 08:30 Breakfast

09:00 – 11:00 **Panel Discussion: The path forward: The convergence of modeling and experiment in EAC**

Moderator: Ron Latanision, Exponent Inc, USA.

Panelists: Keynote speakers and government program managers

11:00 – 11:20 **Workshop Closing**

11:30 – 12:30 Lunch