CONFERENCE ON HYDROGEN IN MATERIALS

Sponsored by ASTM Committee F07.04 on Hydrogen Embrittlement

June 3-6, 2025
La Rochelle University
La Rochelle, France

ABOUT THE CONFERENCE

Hydrogen embrittlement has historically been a concern where hydrogen is absorbed by materials, either during manufacturing processes or as a byproduct of corrosion. With the advent of the hydrogen economy, the scope of research has grown to include material interaction with hydrogen gas. The infrastructure needed for hydrogen gas storage and transportation, as well as the materials needed at the point of use of hydrogen fuel, for heating or in vehicles, trains, and aircraft, are now part of the conversation. This conference provides a forum for the global hydrogen embrittlement research and testing communities to meet and exchange ideas on the latest fundamental research, and advances in technology, and to consider engineering implications across all industrial sectors.

Topics for this conference include, but are not limited to:

- Hydrogen and structural integrity in industrial sectors
  - Topics include manufacturing process from *raw materials* to *finished products* with an emphasis on *standards and practices:*
    - Automotive
    - Aerospace
    - Naval
    - Hydrogen storage & transport
    - Energy (Oil & Gas, Nuclear, etc.)
- Fundamentals of hydrogen interaction in materials
  - Computational approaches of hydrogen and its effect on materials
  - Effect of hydrogen on fracture
  - Effect of hydrogen on additive manufacturing
  - Hydrogen embrittlement susceptibility
  - Hydrogen damage mechanisms (hydrogen embrittlement, hydride embrittlement, SCC, High temperature H attack, HIC, HE-fatigue, etc.)

CONFERENCE COCHAIRS:

Jamaa Bouhattate
La Rochelle University
La Rochelle, France

Salim Brahimi
Industrial Fasteners Institute and McGill University
Montreal, Canada

CONFERENCE TECHNICAL COMMITTEE:

Ed Babcock
Boeing Mesa
Mesa, Arizona, USA

Evelin Barbosa de Melo
McGill University
Montreal, Canada

Stefan Beyer
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Hagen, Germany

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Sydney, Australia
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Milos Djukic
University of Belgrade
Belgrade, Serbia

Matsunaga Hisao
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Fukuoka, Japan

Emilio Martinez-Paneda
Oxford University
Oxford, United Kingdom

Sriraman Rajagopalan
Canadian Nuclear Laboratories
Deep River, Ontario, Canada

Laura Moli Sanchez
French Corrosion Institute
St-Étienne, Auvergne-Rhône-Alpes, France

TUESDAY, JUNE 3, 2025

8:45 **Opening Remarks**
Jamaa Bouhattate and Salim Brahimi, *Conference Cochairs*

SESSION 1
Session Chair: Emilio Martinez Paneda, *Oxford University, Oxford, United Kingdom*

9:00 **Plenary: (*Title TBD*)**
Xavier Feaugas, *LaSIE Laboratory, La Rochelle University, La Rochelle, France*

9:30 **Crack Initiation Due to Low Cycle Fatigue in X60 Pipeline**
Thorsten Michler, *Fraunhofer Institute for Mechanics of Materials IWM, Freiburg, Germany*

9:50 **Atomistic Analysis of Twinning Condition from Edge Dislocation Pinned by Hydrogen in BCC Iron**
Ryosuke Matsumoto, *Kyoto University of Advanced Science, Kyoto, Japan*

10:10 **Evidence of Hydrogen Diffusion In Steel Through Testing Embrittlement Relief Bake Variables to Reduce Bake Times after Electroplating**
Chad Hogan, *United States Air Force, Layton, Utah, USA*

10:30 BREAK

SESSION 2
Session Chair: Milos Djukic, *University of Belgrade, Belgrade, Serbia*

10:50 **Keynote: Influence of Highly Pressurized Dihydrogen and Gas Blends on Fatigue Crack Growth**
Gilbert Hénaff, *ISAE-ENSMA, Chasseneuil-du-Poitou, France*

11:20 **Application of Controlled Hydrogen-assisted Cracking to Assess Fracture Mechanics of Circumferentially Notched Tensile Specimens**
Michael Brilz, *Technical University of Darmstadt, Darmstadt, Germany*

11:40 **A Discussion on the Conservatism of Fracture Toughness in a Hydrogen Gas Environment when Comparing Compact Tension (CT) and Single Edge Notch Tensile (SENT) Specimens**
Laura Moli Sanchez, *French Corrosion Institute, St-Étienne, Auvergne-Rhône-Alpes, France*

12:00 **Hydrogen-assisted Fracture in Ni-based Superalloy 718: Criteria for Crack Initiation**
Yuhei Ogawa, *National Institute for Materials Science, Tsukuba, Japan*

12:20 LUNCH

SESSION 3

Session Chair: Abdelali Oudriss, *LaSIE Laboratory, La Rochelle University, La Rochelle, France*

13:50 **<u>Keynote:</u> The HELP mechanism: History, Elucidation, Legends, and Protons**
May L. Martin, *National Institute of Standards and Technology, Boulder, Colorado, USA*

14:20 **From Crack Initiation to Macroscopic Fracture: A Holistic Characterization of Hydrogen Environmentally Assisted Cracking (HEAC) for AA7449-T7651**
Unai De Francisco Vargas, *TECNALIA Research and Innovation, Donostia, Spain*

14:40 **Fracture Testing and Modelling of API X60 Pipeline Steel under In-situ Gaseous Hydrogen**
Andrés Diaz, *University of Burgos, Burgos, Spain*

15:00 **Hydrogen-assisted Fracture in Ni-based Superalloy 718: Static/Dynamic Crack Propagation**
Osamu Takakuwa, *Kyushu University, Fukuoka, Japan*

15:20 **Direct Observation of Strain-enhanced Hydrogen Segregation and Fracture at High-angle Grain Boundaries**
Andrew Lee, *Villanova University, Villanova, Pennsylvania, USA*

15:40 BREAK

SESSION 4

Session Chair: Yi-sheng (Eason) Chen, *University of Sydney, Sydney, Australia, and Nanyang Technological University, Singapore*

16:00 **<u>Keynote</u>: Fitness for Hydrogen Service: Fracture Mechanics Measurements in Gaseous Hydrogen and Structural Integrity Assessment**
Chris San Marchi, *Sandia National Laboratories, Livermore, California, USA*

16:30 **Unveiling and Mitigating Hydrogen Embrittlement in Ferritic Steels at Cryogenic Temperatures: A Combined Experimental and Computational Approach**
Ravi Raj, *University of Nantes, Jean Rouxel Institute of Materials, Nantes, France*

16:50 **Effect of Hydrogen Gas Precharging on the Mechanical Properties and Fatigue Life of L-PBF Inconel 718 in Temperature**
Donaldine Tade, *ONERA, Paris, France*

17:10 **Development of an Equivalence Approach in Terms of Hydrogen Embrittlement between Cathodic and Gaseous Hydrogen Charging**
Scott Coop-Phane, *CEA-Liten, Grenoble, France*

17:30 **The Review of the Model for the Synergistic Action of Hydrogen Embrittlement Mechanisms in Metallic Materials: Unified HELP+HEDE Model**
Milos Djukic, *University of Belgrade, Faculty of Mechanical Engineering, Belgrade, Serbia*

17:50 CONFERENCE DAY #1 ADJOURNS

19:00 Dinner and Aquarium Visit

WEDNESDAY, JUNE 4, 2025

SESSION 5

Session Chair: Alixe Dreano, *Mines Saint-Etienne, Saint-Etienne, France*

8:30 **Keynote: Material Challenges in H_2 Applications**
Nuria Fuertes, *Swerim (Swedish Institute for Metal Research), Stockholm, Sweden*

9:00 **Role of Alloying Elements in Increasing Hydrogen Embrittlement Resistance of Steel Welds**
Chi Ching Chiang, *Metal Industries Research and Development Center, Kaohsiung, Taiwan*

9:20 **Effect of Hydrogen on Fast Fracture of X70 in Nordic Operation Conditions**
Sebastian Lindqvist, *VTT Technical Research Centre of Finland, Espoo, Finland*

9:40 **FEATHER: Steel Solution For nExt generATion H2 cylindERs**
Tuhin Das, *ArcelorMittal Global Research and Development, Ghent, Belgium*

10:00 **Effects of Temperature and Hydrogen on Fatigue Properties of Austenitic Stainless Steel**
Romain Chochoy, *Pprime Institute, Poitiers, France*

10:20 BREAK

SESSION 6

Session Chair: Evelin Barbosa de Melo, *McGill University, Montreal, Quebec, Canada*

10:40 **Keynote: Hydrogen Embrittlement in Metastable Austenitic Steels: Mechanism and Alloy Design**
Motomichi Koyama, *Tohoku University, Sendai, Japan*

11:10 **Effects of Hydrogen and Vacancy on Elastic and Plastic Properties in Nickel Single Crystals: Atomistic Simulation of Nano-indentation**
Nadjib Iskounen, *Process and Materials Sciences Laboratory (LSPM), University Sorbonne Paris-Nord, Villetaneuse, France*

11:30 **Hydrogen Trapping at Grain Boundaries in FeCr Alloys and its Effect on the Mechanical Behavior**
Maria Duarte Correa, *Max-Planck Institute for Sustainable Materials, Düsseldorf, Germany*

11:50 **Microstructural-based Mitigation Strategies to Improve the Hydrogen Embrittlement Resistance**
Tom Depover, *University of Ghent, Ghent, Belgium*

12:10 **Microstructure Engineering for Hydrogen Trapping and Embrittlement Resistance**
Yi-sheng (Eason) Chen, *University of Sydney, Sydney, Australia, and Nanyang Technological University, Singapore*

12:30 LUNCH

SESSION 7
Session Chair: Sriraman Rajagopala, *Canadian Nuclear Laboratories, Chalk River, Ontario, Canada*

14:00 **Keynote: Hydrogen Embrittlement in Hypo-eutectoid and Eutectoid Steels**
Young-Kook Lee, *Research Center for Advanced Materials for Future Vehicles, Yonsei University, Seoul, South Korea*

14:10 **High Energy X-Ray Diffraction and Small-Angle Scattering Measurements of Strain, Dislocation Density, and Porosity Ahead of Cracks Grown in Hydrogen By Fatigue and Fracture**
Matthew Connolly, *National Institute of Standards and Technology, Louisville, Colorado, USA*

14:50 **Unravelling Temperature-programmed Hydrogen Desorption**
Emilio Martinez-Paneda, *University of Oxford, Oxford, United Kingdom*

15:10 **Strain Rate Effects on Hydrogen Embrittlement in Steel Insights from X-ray 3D Tomography**
Yazid Madi, *Materials Center (MAT), Mines Paris-PSL, Paris, France*

15:30 **Effect of Phosphorus Content and Tempering Temperature on Fatigue Crack Growth in Martensitic Steel under High-pressure Hydrogen**
Aman Arora, *Kyushu University, Fukuoka, Japan*

15:50 BREAK

SESSION 8:
Session Chair: Ed Babcock, *Boeing Mesa, Mesa, Arizona, USA*

16:20 **Keynote: Hydrogen Embrittlement of Titanium Alloys: Impacts of Hydrogen on the Microstructure and on Mechanical Behavior; Risk Assessments for Engineers**
Simon Frappart, *Naval Group, Paris, France*

16:50 **Hydrogen Environment-Assisted Cracking Behavior of Binder Jet Printed 17-4PH Stainless Steels in Marine Environments**
Zachary Harris, *University of Pittsburgh, Pittsburgh, Pennsylvania, USA*

16:10 **Effects of Si on Hydrogen Embrittlement in CoCrNi Medium-Entropy Alloys**
Hung-Wei (Homer) Yen, *National Taiwan University, Taipei, Taiwan*

16:40 **Advanced Understanding of Hydrogen-defect Interactions by Use of the Internal Friction Technique**
Liese Vandewalle, *Ghent University, Ghent, Belgium*

17:00 **Nanoscale Imaging of Hydrogen-materials Interaction: An In-situ Approach Based on Secondary Ion Mass Spectrometry**
Athira Kumar, *Luxembourg Institute of Science and Technology, Belvaux, Luxembourg*

17:20 **Embrittlement Effects Induced by Hydrogen Focused Ion Beams**
Chad Rue, *Thermo Fisher Scientific, Hillsboro, Oregon, USA*

17:40 CONFERENCE DAY #2 ADJOURNS

THURSDAY, JUNE 5, 2025

SESSION 9

Session Chair: Matsunaga Hisao, *Kyushu University, Fukuoka, Japan*

8:30 **Keynote: The Role of Hydrogen Induced Brittle Fracture in Automotive Fastener Applications with High Strength and Ultra-high Tensile Strength Bolts**
Horst Dieterle, *KAMAX Automotive GmbH, Homberg, Germany*

9:00 **Effect of Change in Microstructure Features and Alloy Composition on Hydrogen Embrittlement Susceptibility of High-Tensile Fasteners**
Manoj Arthanari, *McGill University, Montreal, Quebec, Canada*

9:20 **The Behavior of High-Temperature Hydrogen Diffusion and Mechanical Properties in Additive Manufactured Ni-base Superalloy for Gas Turbine Hot Parts**
Daichi Akama, *Mitsubishi Heavy Industries, Ltd., Takasago, Japan*

9:40 **A New Approach towards Hydrogen Embrittlement Resistant Ultra-High Strength Steel Fasteners**
Christian Schnatterer, *KAMAX Automotive GmbH, Homberg, Germany*

10:00 **Study of Hydrogen Embrittlement Risk in High-Strength Steel Fasteners Under Stress in a Hydrogenating Environment**
Daniella Guedes Sales, *Cetim, Nantes, France*

10:20 **Effect of Hydrogen on Creep Properties of Pure Iron**
Kentaro Wada, *Kyushu University, Fukuoka, Japan*

10:40 BREAK

SESSION 10

Session Chair: Stefan Beyer, *German Fastener Association (DSV), Hagen, Germany*

11:00 **Understanding the Hydrogen Embrittlement Behavior of Welded High Strength Low Alloy Steels**
Shahid Parapurath, *Curtin University, Bentley, Australia*

11:20 **Hydrogen Embrittlement of Low-Alloy Tempered Martensitic Steels**
Livia Cupertino Malheiros, *Department of Civil and Environmental Engineering, Imperial College London, London United Kingdom*

11:40 **Repair Welding on Future Pressurized Hydrogen Pipelines**
Tomás Grimault de Freitas, *Federal Institute for Materials Research and Testing (BAM), Berlin, Germany*

12:00 **Influence of Test Rate and Temperature on Degree of Crystallinity and Related Mechanical Performance of Thermoplastic Polymers Used in H2 Pipelines**
Nalini Menon, *Sandia National Labs, Livermore, California, USA*

12:20 **The Effect of 50 – 250 °C Tempering on Hydrogen Diffusion, Trapping, and Embrittlement Mechanisms in Direct-quenched Martensitic Steel**
Renata Latypova, *University of Oulu, Oulu, Finland*

12:40 LUNCH

SESSION 11

Session Chair: Tom Depover, *University of Ghent, Ghent, Belgium*

14:00 **Accelerated Hydrogen Embrittlement Screening via Small Punch Test: Case Study on X70 Pipeline Steel**
Chandrahaasan Soundararajan, *VTT Technical Research Centre Of Finland Ltd, Espoo, Finland*

14:20 **Pressure-Dependent Hydrogen Assisted Degradation of 316L Investigated with the Hollow Specimen Technique**
Jonathan Nietzke, *Federal Institute for Materials Research and Testing (BAM), Berlin, Germany*

14:40 **Data-driven Failure Assessment Diagrams for Pipelines Operating in Hydrogen Environments**
Nicolas Larrosa, *University of Bristol, Bristol, United Kingdom*

15:00 **Influence of Specimen Geometry on the Ductility Properties of X65 Weld Tested In-situ in 60 Bar Gaseous Hydrogen**
Tomás Freitas, *Federal Institute for Materials Research and Testing (BAM), Berlin, Germany*

15:20 **Material and Structural Integrity Assessment for Safe Nordic Hydrogen Transportation Infrastructure**
Vigdis Olden, *SINTEF, Ranheim, Norway*

15:40 BREAK

SESSION 12

Session Chair: Laura Moli Sanchez, *French Corrosion Institute, St-Étienne, Auvergne-Rhône-Alpes, France*

16:00 **<u>Keynote</u>: Hydrogen Research Activities at Canadian Nuclear Laboratories**
Helmut Fritzsche, *Canadian Nuclear Laboratories, Chalk River, Ontario, Canada*

16:30 **In-situ Neutron Diffraction Study of Stacking Fault Energy in Hydrogen-charged Type 310S Austenitic Steel at Low Temperatures**
Tatsuya Ito, *Japan Atomic Energy Agency, Naka-gun, Japan*

16:50 **Evaluation of Ceramic-coatings as Hydrogen Permeation Barrier for High-temperature Fusion Reactor Components**
Yijun Lui, *The Manufacturing Technology Centre, Coventry, United Kingdom*

17:10 **Unveiling Hidden Mechanisms on High Entropy Alloys to Counteract Hydrogen Embrittlement**
Marcelo Paredes, *Texas A&M University, Galveston, Texas, USA*

17:30 **Atom Probe Tomography and Its Application to the Analysis of Hydrogen**
Robert Ulfig, *AMETEK, Elancourt, France*

17:50 CONFERENCE DAY #3 ADJOURNS

FRIDAY, JUNE 6, 2025

SESSION 13

Session Chair: Jun Song, *McGill University, Montreal, Quebec, Canada*

8:30 **<u>Keynote:</u> Investigating Hydrogen Embrittlement of Oligocrystalline Nickel-201 Alloy**
Dhiraj K. Mahajan, *Dept. of Mechanical Engineering, Indian Institute of Technology (IIT)-Ropar, Bara Phool, India*

9:00 **Finite Element Modeling of the Hydrogen-plasticity Interactions in Iron at the Crystal Scale**
Minh Duc Nguyen, *Process and Materials Sciences Laboratory (LSPM), University Sorbonne Paris-Nord, Villetaneuse, France*

9:20 **Cohesive Zone Models to Simulate Hydrogen Embrittlement in 2.25Cr1Mo Steel**
Chiara Colombo, *Polytechnic University of Milan, Milan, Italy*

9:40 **Microstructure-resolved Model for Hydrogen Diffusion and Trapping in Multiphase Medium-manganese Steels**
Abdelrahman Hussein, *Oulu University, Oulu, Finland*

10:00 **Modeling the Multi-level Kinetic Hydrogen Trapping in Metals**
Jonathan Mougenot, *Process and Materials Sciences Laboratory (LSPM), University Sorbonne Paris-Nord, Villetaneuse, France*

10:20 BREAK

SESSION 14

Session Chair: Aman Arora, *Kyushu University, Fukuoka, Japan*

10:40 **Deep Learning Approach to Carbide Quantification in Lower Bainite and Tempered Martensite High Strength Steels**
Evelin Barbosa de Melo, *McGill University, Montreal, Quebec, Canada*

11:00 **Theoretical Model for the Hydrogen Embrittlement of Metastable Austenitic Stainless Steels at Low Temperatures**
Rafael Magalhaes de Melo Freire, *University of Tokyo, Tokyo, Japan*

11:20 **Deep Learning Aided Microstructural Characterization of Lower Bainite and Tempered Martensite High Strength Steel**
Jun Song, *McGill University, Montreal, Quebec, Canada*

11:40 **Hydrogen Absorption and Diffusion in TiCr2 Laves Phases Based on Density Functional Theory and Machine-Learning Interatomic Potentials**
Pranav Kumar, *Institute of Material Science, University of Stuttgart, Stuttgart, Germany*

12:00 LUNCH & Poster Award

SESSION 15

Session Chair: Daniella Guedes Sales, *Cetim, Nantes, France*

13:50 **Impact of Laser Treatment on Hydrogen Permeation in Fe-Cr Alloy**
Alixe Dreano, *Mines Saint-Etienne, Saint-Etienne, France*

14:10 **Effect of Surface Mechanical Attrition Treatment on X80-steel Grade for Hydrogen Gas Transmission Pipelines**
Mathis Gente, *Mechanics and Civil Engineering Laboratory (LMGC), University of Montpellier, Montpellier, France*

14:30 **Extreme High-speed Laser Deposition as a Barrier Coating Technology for Hydrogen Embrittlement Protection in Steels**
Yingwei Wu, *Fraunhofer ILT, Aachen, Germany*

14:50 **Effect of Surface Mechanical Roughening on Hydrogen Uptake in Steels**
Sarah Alzein, *Mines Saint-Etienne, Saint-Etienne, France*

15:10 BREAK

SESSION 16

Session Chair: Livia Cupertino Malheiros, *Department of Civil and Environmental Engineering, Imperial College London, London United Kingdom*

15:30 **Hydrogen Embrittlement Susceptibility of Additively Manufactured Inconel 718 Alloy in Various Metallurgical States**
Dylan Cozlin, *LaSIE Laboratory, La Rochelle University, La Rochelle, France*

15:50 **Hydrogen Embrittlement Re-understood: Unravelling the Role of Hydrogen on Plasticity**
Alfredo Zafra, *University of Oxford, Oxford, United Kingdom*

16:10 **Evaluation of Hydrogen Embrittlement Susceptibility of Ni-Cr-Mo-based Alloys Using Small Punch Test in Assisted Environment**
Luiz Almeida, *Federal University of Uberlândia, Uberlândia, Brazil*

16:30 **<u>Keynote:</u> The Effect of Hydrogen Precharging Variables on Embrittlement Characteristics of Steels**
Stephen Yue, *McGill Institute for Aerospace Engineering & McGill Hydrogen Embrittlement Facility, McGill University, Montreal, Quebec, Canada*

17:00 CONFERENCE ENDS

POSTERS

Analysis of Imbalanced Data from Porosity Measurements on High-Pressure Hydrogen Vessel (Type IV)
Lina ACHOUR, *Roberval, University of Technology of Compiègne, Compiègne, France*

Hydrogen Fugacity during Cathodic Hydrogen Charging of X65 Pipeline Steel
Andrej Atrens, *The University of Queensland, School of Mechanical and Mining Engineering, Queensland, Australia*

Pinning and Depinning of Stacked Edge Dislocations in bcc-Fe under a Hydrogen Gaseous Environment
Akhil Badramraju, *Kyoto University of Advanced Science, Kyoto, Japan*

Experimental Analysis of Plasticity-Hydrogen Interactions in Commercially Pure Titanium
Wisline Beucia, *Université Sorbonne Paris Nord, Villetaneuse, France*

Enhancing Steel Performance Against Hydrogen Embrittlement through Carbon Vacancy Engineering in Vanadium and Niobium Carbides
Xiaohan Bie, *McGill University, Montréal, Canada*

The Influence of Hydrogen on Phase Transformations in Aluminum Alloys
Omar Boukir, *Groupe de Physique des Matériaux (GPM), Rouen, France*

Study of Hydrogen Effects for the Casing and Overpack Foreseen in the High-Level Waste Geological Disposal
Nicolas Bulidon, *Institut de la Corrosion, Fraisses, France*

Hydrogen Interaction with Welds Studied in Different Pipeline Steels
Margo Cauwels, *Ghent University, Ghent, Belgium*

FE Simulations of Tests for Hydrogen Embrittlement: Disk Pressure Test Versus Small Punch Test
Yann Charles, *Université Sorbonne Paris Nord, Villetaneuse, France*

Insights on the Hydrogen Interaction with Additive Manufactured FCC Materials
Lisa Claeys, *Ghent University, Ghent, Belgium*

Determination of Hydrogen Concentrations in Terrestrial and Chondritic Olivines by Atom Probe Tomography
Frederic Danoix, *Université de Rouen - Groupe de Physique des Matériaux, Saint Etienne du Rouvray, France*

Evaluating Hydrogen Embrittlement Sensitivity in High Strength Steel
Ayoub El Moutaouakkil, *CETIM, Nantes, France*

The Impact of Surface Condition on the Susceptibility to Hydrogen Embrittlement of Austenitic Stainless Steel Using the Hollow Specimen Technique
Tomás Grimault de Freitas, *Bundesanstalt für Materialforschung und -prüfung, Berlin, Germany*

Compositional Tuning of Hydrogen Storage in Laves-Phase Alloys Based on Density Functional Theory
Yuji Ikeda, *University of Stuttgart, Stuttgart, Germany*

First Principles Study on the Impact of Molybdenum in Reducing Hydrogen's Detrimental Effects on Bcc Iron
Shinya Kato, *Kyoto University of Advanced Science, Kyoto, Japan*

Understanding the Influence of the Degassing Parameters on the Evolution of Hydrogen States in Maraging Steels
Lou Kheir, *La Rochelle Universite, La Rochelle, France*

Study of the Interaction between Hydrogen and Screw Dislocations in Alpha-Fe by Multi-Scale Simulations
Margot Lucas, *La Rochelle University, LaSIE, Paris, France*

Methodological Developments towards a Better Understanding of Hydrogen Absorption and Desorption Mechanisms in Automotive High Strength Steels
Melodie Mandy, *CRM Group, Liège, Belgium*

Crystallographic Control of Hydrogen Ingress in BCC-Iron: Insights from Ab-Initio Simulations
Lukas Meier, *Ghent University, Ghent, Belgium*

Effect of Hydrogen on Nanomechanical Behavior of Additively Manufactured 316L Stainless Steel
Supriya Nandy, *Materials for Emerging Technologies VTT Technical Research Centre of Finland, Espoo, Finland*

Interaction of Hydrogen with Modern and Vintage Pipeline Steel Microstructures
Sakari Pallaspuro, *University of Oulu, Oulu, Finland*

Understanding the Degradation Mechanisms and Hydrogenation Kinetics of Fetih2 Using DFT Calculations
Samia Rachidi, *Faculty of Sciences, Mohammed V University of Rabat, Safi, Morocco*

A New Modeling Approach to Predict Hydrogen Embrittlement Induced Ductile-to-Brittle Transition in High Strength Steels
Sidharth Sarmah, *McGill University, Montreal, Canada*

Impact of Defects and Oxide Concertation of Graphene Oxide on Hydrogen Diffusion
Sushanta Sethi, *Mechanical Materials and Aerospace Engineering (MMAE) Indian Institute of Technology (IITdh), Dharwad, India*

Mitigating Hydrogen Embrittlement in Inconel 718 through Laser Shock Peening
Vijay Shankar Sridharan, *School of Material Science and Engineering, Nanyang Technological University, Singapore, Singapore*

The Effect of Plastic Deformation on Hydrogen Diffusion in Additively Manufactured Nickel Alloy 625
Vijay Shankar Sridharan, *School of Material Science and Engineering, Nanyang Technological University, Singapore, Singapore*

Possibility of Transgranular Crack Formation due to the Interaction of Hydrogen with Vacancies and Dislocations in BCC-Fe using Atomistic Simulations
Shinya Taketomi, *Saga University, Saga, Japan*

Influence of Molecular Interaction Affinity on H2 Permeation and Diffusion in Polymers
ShiLiang Johnathan Tan, *Matcor Technology & Services Pte Ltd, Singapore, Singapore*

Simplified Methods for Determining Hydrogen Embrittlement (HE) Susceptibility in Alloy Steels and Carbon Steels under Various Plating Processes and Service Environments, and for Determining the Efficacy of Post Plating Relief Baking Based on Material Size
Carmen Vertullo, *Carver Labs, El Cajon, California, USA*

Effect of Nb Microalloying on Hydrogen Embrittlement Susceptibility of Quenched and Tempered Casing Steels
Xu Zheng, *McGill University, Montreal, Canada*