

Technical Program

Sunday, September 9

Opening Session

7:00-7:45 PM <i>*Invited</i>	Hydrogen's Ubiquity: Fixating, Facilitating, Fracturing, Flip-Flopping <i>W. Gerberich, E. Hintsala (USA)</i>
7:45-8:30 PM <i>*Invited</i>	Theory and Experiments on Hydrogen-Defect Interactions <i>R. Kirchheim (Germany)</i>
8:30-8:50 PM	<i>Break</i>
8:50-9:20 PM <i>*Invited</i>	Title <i>K. Randolph (USA)</i>

Monday, September 10

Hydrogen Effects in Steels I

8:00-8:30 AM <i>*Invited</i>	Measurement and Modeling of Temperature Dependent Internal Hydrogen Assisted Cracking <i>R. Gangloff (USA)</i>
8:30-9:00 AM <i>*Invited</i>	Hydrogen Embrittlement of Steels: New Observations on Micromechanisms of Fracture <i>N. Thirumalai, S. Rajagopalan, D. Valiveti, J. Li (USA)</i>
9:00-9:20 AM	The Effect of Nano-Sized TiC Precipitates on Hydrogen Embrittlement of Tempered Lath Martensitic Steel <i>A. Nagao, B. Eftink, M. Dadfarnia, B. Somerday, P. Sofronis (Japan, USA)</i>
9:20-9:40 AM	Hydrogen Embrittlement in Ultrafine Elongated Grain Structure Steel Processed by Warm Tempforming <i>Y. Kimura, T. Inoue, E. Akiyama, K. Tsuzaki (Japan)</i>
9:40-10:00 AM	Identification of Hydrogen Desorption Peak Temperatures, Binding Energies, and Occupation Ratios at Vacancies, Dislocations and Grain Boundaries in Iron and Steel <i>K. Takai, N. Abe (Japan)</i>
10:00-11:00 AM	<i>Poster Session I and Break</i>

Poster Session I

Fatigue Crack Growth of Pipeline Steel in Gaseous Hydrogen - Predictive Model Calibration to API-5L X52

R. Amaro, E. Drexler, N. Rustagi, N. Nanninga, Y. Levy, A. Slifka (USA)

A Numerical and Experimental Study of the Disk Pressure Test

K. Ardon, Y. Charles, P. Levée, M. Gaspérini (France)

Mechanical Behavior and Fractography of 304 Stainless Steel with High Hydrogen Concentration

M. Au (USA)

On the Role of Hydrogen During the Corrosion Processes Affecting the 2024 Aluminum Alloy

C. Larignon, E. Andrieu, J. Alexis, G. Odemer, C. Blanc (France)

Effect of Material Characteristics on Hydrogen Embrittlement Susceptibility of High Strength Steel

S. Brahim, S. Yue, S. Rajagopalan (Canada)

Hydrogen Embrittlement of a Low Alloyed Steel in High Pressure Wet Hydrogen

L. Briottet, A. Guilloud, P. Lemoine, I. Moro, E. Bousquet, C. Blanc, E. Andrieu, G. Odemer (France)

Comparison of the Tensile Behavior of a Tempered 34CrMo4 Steel Exposed In Situ to High Pressure H₂ Gas or to Cathodic H Charging

L. Moli-Sanchez, F. Martin, E. Leunis, L. Briottet, P. Lemoine, J. Chêne (France, Belgium)

Hydrogen Embrittlement in Super Duplex Stainless Steel Tubes UNS S32750 Under Mechanical Stress

B. da Silva, F. Salvio, D. dos Santos (Brazil)

On the Influence of Hydrogen on Fracture Modes of Symmetrical Tilt Grain Boundaries in Nickel

G. Xu, M. Demkowicz (USA)

Evaluation of the Effect of In-Situ Hydrogen Charging on the Mechanical Properties of Iron-Based Alloys

T. Depover, E. Wallaert, L. Duprez, K. Verbeke (Belgium, Germany)

Investigation Into the Effects of Hydrogen Embrittlement on Experimental 304 Stainless Steel Alloys Modified with Palladium and Ruthenium Additions

R. Doyle, B. Connolly (UK)

Fatigue Testing of Pipeline Welds in Pressurized Hydrogen Environments

E. Drexler, N. Rustagi, D. Lauria, R. Amaro, A. Stevenson, P. Keefe, A. Slifka (USA)

Effect of Chromium Content on the Hydrogen Permeation in Ni alloys

O. Flores, H. Martinez, B. Campillo, G. Aramburo, G. Lara, I. Puente, J. Zagal, A. Aguilar, H. Lopez (México, USA)

Assessment of Influence of Hydrogen on Deformation Behavior by Coupled Experimental and Numerical Method

P. Schwittek, M. Zamanzade, A. Barnoush, A. Hartmaier (Germany)

Effects of Internal Hydrogen, Low Temperature, and Crack Orientation on Fracture Initiation Toughness of Forged 304L Austenitic Stainless Steel

H. Jackson, C. San Marchi, D. Balch, B. Somerday (USA)

Hydrogen Absorption in Ni Base Alloys Exposed to PWR Primary Simulated Media

F. Jambon, L. Marchetti, F. Martin, J. Chêne (France)

Multi-field Modelling of Hydrogen Transport and Fracture in Transition Metals

L. Jernkvist, A. Massih (Sweden)

Effect of Hydrogen and Addition of Oxygen on Fretting Fatigue Properties

M. Kubota, Y. Adach, Y. Shiraishi, R. Komoda, J. Furtado, Y. Kondo (Japan, France)

Evaluation of the SCC-Susceptibility of Cold Worked Structural Steels using Local Hydrogen Measurements

A. Luithle, T. Suter, M. Pohl (Germany, Switzerland)

Microalloyed Steels Crack Propagation Resistant Due to Hydrogen and Static Stress Level Effects in Notched MWOL Specimens

M. Miranda-Salgado, S. Serna, A. Molina, B. Campillo, H. López (México, USA)

Hydrogen-Induced Large Tensile Elongation in V-Ni Alloys

C. Nishimura, H. Okubo, M. Komaki (Japan)

Grain Size and Grain-Boundaries Consequences on Diffusion and Trapping of Hydrogen in Pure Nickel

A. Oudriss, J. Bouhattate, J. Creus, E. Conforto, B. Peraudeau, C. Savall, X. Feaugas (France)

Effect of Cryogenic Processing on the Stress Corrosion Cracking Resistance of AerMet[®]100 Ultra-High Strength Steel

G. Pioszak, Y. Lee, W. Garrison, R. Gangloff (USA)

Experimental Uncertainties in Using Cathodic Charging to Emulate Embrittlement by Hydrogen Gas in Pipeline Steels

R. Ricker, D. Pitchure, A. Slifka, N. Nanninga, J. McColskey, R. Condon (USA)

Fatigue Crack Initiation in Hydrogen-Precharged Austenitic Stainless Steel

C. San Marchi, B. Somerday, K. Nibur (USA)

A Nanoscale Mechanism of Hydrogen Embrittlement in Metals

J. Song, W. Curtin (Canada, Switzerland)

UV Raman Spectroscopy: A Method to Overcome Fluorescence in LiH Caused by Hydrogen Deficiencies

A. Stowe, N. Smyrl (USA)

Hydrogen Embrittlement Resistance of an Ultra High Strength Steel Sheet for Automobile
S. Takagi, Y. Toji, M. Yoshino, K. Hasegawa, N. Wada, K. Takai, Y. Hagihara (Japan)

Hydrogen Enhanced Dislocation Emission at a Crack Tip
Y. Wang, D. Connétable, D. Tanguy (France)

Role of Welding on the Hydrogen Embrittlement Susceptibility of a Tempered X4CrNiMo 16.5.1 Martensitic Stainless Steel
L. Marchetti, E. Herms, J. Chêne, S. Thiebaut, F. Buy, J. Farre (France)

Changes in Mechanical Properties and Electronic Structures of Hafnium Hydrides by Hydrogen-Induced Phase Transformations
B. Tsuchiya, R. Sahara, M. Oku, K. Kurosaki, K. Konashi (Japan)

Combination of Electrochemical Methods with Thermal Analysis to Reveal Diffused and Trapped Hydrogen in Steels: A Microstructural Perspective
A. Uluc, A. Böttger (The Netherlands)

Effects of Cyclic Plastic Strain on Hydrogen Environment Assisted Cracking in High-Strength Steel
F. Vucko, C. Bosch, D. Delafosse (France)

Effect of Intermetallic Compound Particles on the Invading Behavior of Hydrogen into Aluminum
T. Watakabe, G. Itoh, Y. Hatano (Japan)

Advanced Methods for Characterizing Hydrogen-Materials Interactions I

11:00-11:20 AM In-Situ Examination of Hydrogen Behavior in Stainless Steel by Using Energy Dispersive Diffraction Synchrotron
E. Dabah, T. Kannengiesser, T. Boellinghaus, D. Eliezer (Israel, Germany)

11:20-11:40 AM Application of Kelvin Force Microscopy and Secondary Ion Mass Spectroscopy to Evidence Hydrogen Embrittlement of the 2024 Aluminum Alloy
C. Larignon, E. Andrieu, J. Alexis, L. Lacroix, G. Odemer, C. Blanc (France)

11:40-12:00 PM Investigating the “Strongest Links” Against H-embrittlement in Nickel-Based Superalloys
J. Hanson, M. Wang, M. Demkowicz, S. Gradečak (USA)

12:00-12:20 PM Hydrogen Enhanced Plasticity and Failure Revisited 2012
M. Martin, A. Nagao, I. Robertson, P. Sofronis (USA, Japan)

Addressing Hydrogen Embrittlement in Technology I

- 7:00-7:30 PM Hydrogen Embrittlement-Related Issues and Needs in the Hydrogen Value Chain
**Invited*
J. Furtado (France)
- 7:30-8:00 PM Prognostic Control of Cracking in Structures and Components Operating in Hydrogen Service Environments
**Invited*
P. Irving (UK)
- 8:00-8:20 PM Microstructure and Mechanical Property Performance Evaluation of Commercial Grade API Pipeline Steels in High Pressure Gaseous Hydrogen
D. Stalheim, S. Jansto, T. Boggess, S. Ningileri, D. Bromley (USA, Canada)
- 8:20-8:40 PM Measurement of Fatigue of Pipeline Steel in High Pressure Hydrogen Gas
A. Slifka, E. Drexler, R. Amaro, N. Rustagi, D. Lauria, A. Stevenson, P. Keefe, N. Nanninga, Y. Levy, D. Stalheim, L. Hayden (USA)
- 8:40-9:00 PM *Break*

Hydrogen Dissolution, Transport, and Trapping I

- 9:00-9:20 PM Hydrogen Solubility and Trapping in AISI 316L Austenitic Stainless Steel
M. Ganchenkova, O. Todoshchenko, Y. Yagodzinsky, H. Hänninen (Russia, Finland)
- 9:20-9:40 PM Consequences of H-Vacancy Interactions: an Ab Initio Insight
R. Nazarov, T. Hickel, J. Neugebauer (Germany)
- 9:40-10:00 PM Hydrogen Permeation and Trapping on 2¼ Cr-1 Mo Artificial Aged Steel
L. Lemus, D. dos Santos (Brazil)
- 10:00-10:20 PM Thermohydrogen Treatment of Highly Beta-Stabilized Titanium Alloy Ti 38-644 (Beta-C)
P. Schmidt, V. Macin, H.-J. Christ (Germany)

Tuesday, September 11

Modeling and Simulation I

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| 8:00-8:30 AM
<i>*Invited</i> | Understanding H-embrittlement in High-Strength Steels by Ab Initio Methods
<i>J. Neugebauer</i> , U. Aydin, R. Nazarov, J. von Pezold, T. Hickel (Germany) |
| 8:30-8:50 AM | Atomistic Modeling of Hydrogen Trapping in Steels
<i>S. Desai</i> , N. Thirumalai (USA) |
| 8:50-9:10 AM | Molecular Statics Study of the Effect of Hydrogen on Edge Dislocation Motion in Alpha-Fe
<i>S. Taketomi</i> , R. Matsumoto, N. Miyazaki (Japan) |
| 9:10-9:30 AM | Atomistic Simulation on Vacancy Generation and Accumulation Mediated by Dislocations in Hydrogen Embrittlement
S. Li, Y.-C. Lo, L. Qi, T. Neeraj, R. Srinivasan, <i>J. Li</i> (USA, China) |
| 9:30-9:50 AM | Clusters of Intergranular Vacancies Impact Fracture
<i>D. Tanguy</i> (France) |
| 9:50-11:00 AM | <i>Poster Session II and Break</i> |

Poster Session II

- Mechanical Properties of X70 Steel in Gaseous Hydrogen
U. Baek, S. Nahm, H. Lee, Y. Lee (Republic of Korea)
- Hydrogen Effect on Mechanical Properties and Fracture Toughness of Ni-alloy
A. Balitskii, L. Ivaskevich, V. Mochulskiy (Ukraine)
- Hydrogen's Effects on Materials Under Conditions Relevant to Refining of Crude Oil
M. Barney, B. Somerday (USA)
- Hydrogen Embrittlement of AlZnMg Alloys: Experiments and Simulations
N. Ben Ali, D. Tanguy, R. Estevez (France)
- Hydrogen Permeation Properties of a Ferritic-Pearlitic Steel Under Wet Hydrogen Atmosphere
E. Bousquet, C. Blanc, E. Andrieu, G. Odemer (France)
- Fatigue Crack Growth of a C-Mn Steel and of Its Welds Under Hydrogen Pressure
I. Moro, *L. Briottet*, P. Lemoine, O. Doyen, G. de Dinechin (France)

Microstructural Evolution of Cryomilled Palladium/Rhodium Alloy Powder and Its Correlation to Hydrogen Storage Characteristics

P. Cappillino, Z. Zhang, V. Stavila, W. Wolfer, J. Yee, M. Ong, E. Lavernia, N. Yang (USA)

Hydrogen Trapping in Some Cold Rolled States of an API 5L X60 Steel

P. Castaño, P. Bruzzoni (Argentina)

Computational Modeling of Hydrogen Embrittlement in AISI 8630/IN625 Dissimilar Welds

O. Barrera and A. Cocks (UK)

Polymers and Coatings for Tribological Application in Hydrogen Environment

R. Erck, G. Fenske (USA)

Effect of Hydrogen Concentration Gradients Around the Crack Tip on the Fatigue Crack Growth of Ni-Cr-Mo (JIS-SNCM439) Steel

A. Macadre, J. Furtado, F. Barbier, S. Matsuoka, Y. Murakami (Japan, France)

The Influence of Glow Discharge Nitriding on Hydrogen-Induced Changes in Mechanical Properties of Stainless Steels

B. Golebiowski, W. Swiatnicki (Poland)

Hydrogen Diffusion in Ultrafine-Grained Palladium Processed by High-Pressure Torsion

H. Iwaoka, Z. Horita (Japan)

Hydrogen Trapping and Dissolution Behaviour Dependent on Microstructure of Duplex Steel

T. Kannengiesser, S. Brauser, K. Beyer, E. Dabah (Germany)

A New Hydrogen Probe: Non-Destructive Determination of Diffusible Hydrogen in Metals

A. Kirchheim, R. Kirchheim (Germany)

A Study on Long-Term Seal Durability and Fracture Mode of Rubber O-ring by High-Pressure Hydrogen Gas Cycles

A. Koga, T. Yamabe, K. Uchida, J. Nakayama, J. Yamabe, S. Nishimura (Japan)

Effect of Hydrogen, Tempering Temperature and Loading Rate on Fracture Toughness of Low Alloy Steels

M. Kubota, T. Aoki, Y. Kondo (Japan)

Microstructure Change of Hydrogen Storage Materials During Hydrogenation

J. Matsuda, E. Akiba (Japan)

Numerical Simulations to Describe the Contradictory Results of Hydrogen Effects on Macroscopic Deformation

R. Miresmaeili, L. Liu, D. Sasaki, H. Kanayama (Japan)

The Effects of Hydrogen, Tritium, and Heat Treatment on the Deformation and Fracture Toughness Properties of Stainless Steel

M. Tosten, M. Morgan, G. Chapman (USA)

Hydrogen Interaction with Substitutional Solutes and Short-Range Decomposition in fcc Iron-Based Solid Solutions

D. Movchan, V. Shyvanyuk, B. Shanina, Y. Petrov, V. Gavriljuk (Ukraine)

Effects of Hydrogen on Tensile and Torsional Strength Properties of Torsional Prestrained Ferritic-Pearlitic Carbon Steel

H. Nishiguchi, R. Kondo, T. Fukuda (Japan)

Hydrogen Induced Stress Cracking Susceptibility of Hyper Duplex UNS S33207 Stainless Steel Tube

F. Salvio, V. Meyer, B. da Silva, D. dos Santos (Brazil)

Hydrogen-Assisted Fracture in Forged Type 304L Austenitic Stainless Steel

N. Switzner, T. Neidt, J. Hollenbeck, J. Knutson, W. Everhart, R. Hanlin, R. Bergen, D. Balch, C. San Marchi (USA)

Phase Transformation and Change of Structure in Hydrogen Charged Austenitic Steel

V. Shyvaniuk, Y. Mine, S. Teus (Ukraine, Japan)

Characterization of Hydrogen Embrittlement in Zn, Zn-Ni, Cd & Cd-Ti Coated Steel

K. Sriraman, S. Brahim, S. Yue (Canada)

Hydrogen Solubility and Diffusion in Metastable Austenitic Stainless Steels Studied with Thermal Desorption Spectroscopy

O. Todoshchenko, Y. Yagodzinsky, S. Papula, H. Hänninen (Finland)

Hydrogen Embrittlement and Low Temperature Effects on Carbon Steels

L. Vergani, A. Sciuccati, C. Colombo, F. Bolzoni (Italy)

Hydrogen Effect on Microalloyed Steel Mechanical Properties After Several Tempering Schedules

J. Villalobos, S. Serna, B. Campillo (México)

TDS Evaluation of the Hydrogen Trapping Capacity of NbC Precipitates

E. Wallaert, T. Depover, B. Pieters, M. Arafin, K. Verbeken (Belgium, Germany)

Fatigue Crack Growth Behavior of Sealing Rubber Aged in Air and Hydrogen Gas

J. Yamabe, S. Nishimura (Japan)

Modelling the Effect of Microstructure on the Hydrogen Diffusion in X70 pipeline Steel Using Cellular Automata (CA) Technique

N. Yazdipour, A. Haq, E. Pereloma (Australia)

Advanced Methods for Characterizing Hydrogen-Materials Interactions II

- 11:00-11:20 AM Direct Characterization of Dislocation Pipe Diffusion in the Pd-H System Using Incoherent Quasi-Elastic Neutron Scattering and Advanced Computational Methods
B. Heuser, D. Trinkle, E. Schiavone (USA)
- 11:20-11:40 AM Imaging and Quantification of Hydrogen Isotope Trapping
R. Karnesky, N. Bartelt, N. Teslich, M. Kumar (USA)
- 11:40-12:00 PM In-situ Detection of Deuterium in Duplex Stainless Steels Using Time-of-Flight Secondary Ion Mass Spectrometry (TOF-SIMS)
F. Straub, W. Unger, T. Mente, T. Boellinghaus (Germany)
- 12:00-12:20 PM Interactions Between Gaseous Hydrogen and Aluminum Alloys
R. Kolasinski, R. Karnesky, C. San Marchi (USA)
- 12:20-1:45 PM *Lunch*
**Boxed lunches are provided in Trappers Room.*

Hydrogen Dissolution, Transport, and Trapping II

- 1:45-2:15 PM Evaluation of Hydrogen Trapping in Iron-Based Alloys by Thermal Desorption Spectroscopy
**Invited*
D. Perez Escobar, K. Verbeken, L. Duprez, M. Verhaege (Belgium, Germany)
- 2:15-2:35 PM Analytical and Numerical Calculation of Hydrogen Desorption Rate During TDS Analysis Using the Kissinger Formula and the McNabb-Foster Model
F. Wei, M. Enomoto, K. Tsuzaki (Japan)
- 2:35-2:55 PM Influence of Metallurgical and Mechanical States on the Diffusion and Trapping of Hydrogen in Quenched and Tempered Martensitic Steels
J. Creus, S. Frappart, G. Courlit, C. Berziou, E. Conforto, X. Feugas, F. Thébault, L. Delattre (France)
- 2:55-3:15 PM Role of Dislocation Patterns on Hydrogen Trapping in Deformed Nickel: a Deuterium-Thermal Desorption Analysis
F. Martin, P. Laghoutaris, L. Marchetti, A. Oudriss, X. Feugas, J. Bouhattate, J. Creus, J. Chêne (France)
- 3:15-3:35 PM *Break*

Hydrogen Effects on Mechanical Properties of Structural Metals

- 3:35-3:55 PM Environment Assisted Cracking of Steam Turbine Blade Steels – a Consistent Rationalization Based on Hydrogen Assisted Cracking
A. Turnbull, S. Zhou (UK)
- 3:55-4:15 PM Effect of Metallurgical State and Temperature on the Hydrogen Embrittlement Susceptibility of Alloy 718
E. Andrieu, C. Blanc, J.-M. Cloue, F. Galliano, G. Odemer (France)
- 4:15-4:35 PM Crack Tip Electrochemistry Control of Stress Corrosion Cracking of Low Temperature Sensitized Al-Mg Alloys
C. Crane, R. Gangloff (USA)
- 4:35-4:55 PM Fatigue Crack Growth of a C-Mn Steel and of its Welds Under Hydrogen Pressure
I. Moro, L. Briottet, P. Lemoine, O. Doyen, G. de Dinechin (France)
- 4:55-5:15 PM Effects of Cycle Frequency, Electrode Potential and Waveform on Corrosion-Fatigue Crack Growth in High-Strength Steels
M. Knop, N. Birbilis, S. Lynch (Australia)

Wednesday, September 12

Hydrogen Effects in Steels II

- 8:00-8:30 AM Electron Concept for Hydrogen Brittleness of Austenitic Steels
*Invited V. Gavriljuk, V. Shyvanyuk, S. Teus, B. Shanina (Ukraine)
- 8:30-9:00 AM Hydrogen Embrittlement in Fe-Mn-C High Strength Austenitic Steels
*Invited K. Tsuzaki, M. Koyama, E. Akiyama (Japan)
- 9:00-9:20 AM Effect of Strain-Induced Martensite on Hydrogen Charged TRIP Steel
J. Ronevich, J. Speer, G. Krauss, D. Matlock (USA)
- 9:20-9:40 AM Influence of Microstructure and Titanium-Carbonitrides on the
Susceptibility to Hydrogen Embrittlement (HE) in Ultra-High Strength Thin
Steel Grades for the Automotive Industry
J. Rehr, K. Mraczek, A. Pichler, E. Werner (Austria, Germany)
- 9:40-10:00 AM Crystallographic Analysis of Hydrogen-Related Fracture in Medium
Carbon Martensitic Steel
A. Shibata, T. Murata, N. Tsuji (Japan)
- 10:00-11:00 AM *Poster Session III and Break*

Poster Session III

- Monitoring Hydrogen Entry and Corrosion Behavior Under Simulated Atmospheric Corrosion
E. Akiyama, S. Li, T. Shinohara, K. Tsuzaki (Japan)
- Evaluation of Hydrogen Embrittlement Severity in Pulse Plasma Nitrided Steel by Means of In
Situ Electrochemical Nanoindentation
M. Asgari, A. Barnoush, R. Johnsen, R. Hoel (Norway)
- The Effects of Solute Hydrogen on the Mechanical Properties and Crystallization Behavior of
Solar Grade Silicon
D. Bahr, M. Zbib (USA)
- Hydrogen Diffusion and Trapping in Random Heterogeneous Materials: Some Advances Using
FEM on Polycrystalline Description
E. Legrand, J. Bouhattate, X. Feugas, D. Li, H. Garmestani (France, USA)
- Hydrogen Trapping in Super Martensitic and Duplex Stainless Steel Alloys
R. Bar, E. Dabah, D. Eliezer, T. Kannengiesser, T. Boellinghaus (Israel, Germany)
- Recent Developments on Modeling the Hydrogen Deformation Interactions: Implications to
Fracture
M. Dadfarnia, M. Martin, B. Somerday, P. Sofronis, I. Robertson (USA, Japan)

- Hydrogen Embrittlement Susceptibility of Austenitic Fe-Mn-C TWIP Steels
T. Dieudonné, L. Marchetti, M. Wery, J. Chêne, C. Allely, P. Cugy, C. Scott (France)
- Numerical Evaluation of the Choo and Lee's Method for Calculating Hydrogen Detrapping Activation Energies
K. Ebihara, H. Kaburaki, K. Takai (Japan)
- Hydrogen Effects on Screw Dislocation Dissociation and Cross-Slip in FCC Metals
Y. Tang, J. El-Awady (USA)
- Fatigue Testing of Gas Tungsten Arc Welded (GTAW) Type 304 Austenitic Stainless Steel After Hydrogen Exposure
P. Ferro, R. Miresmaeili (USA, Japan)
- Coupled Hydrogen Transport and Deformation of 21Cr-6Ni-9Mn Austenitic Stainless Steel
J. Foulk III, W. Sun, C. San Marchi, B. Somerday, D. Balch (USA)
- Hydrogen-Induced Cracking of Oxygen-Free Phosphorus-Doped Copper
H. Hänninen, E. Malitckii, T. Saukkonen, Y. Yagodzinsky (Finland)
- Fatigue Crack Growth Under High Pressure Gaseous Hydrogen: Experiments and Modelling
C. Moriconi, D. Halm, M. Arzaghi, Z. Sun, G. Benoit, G. Hénaff (France)
- Hydrogen Diffusion and Trapping in a Fe-9%Cr Alloy: Experimental and Theoretical Study
C. Hurtado-Noreña, V. Ramunni, P. Bruzzoni (Argentina)
- Decomposition of ScD₂ Films with Varying Levels of Surface Oxide
D. Kammler, R. Ferrizz, D. Zschiesche, J. Desko, B. Burrow (USA)
- Rapid and Low Cost Method to Determine the Plane Strain Fracture Toughness (K_{Ic}) in Hydrogen
J. Lee (USA)
- Microstructural Effects on the Hydrogen Permeation of an Inconel Alloy 690
J. Zagal, H. López, O. Flores, B. Campillo (México, USA)
- Thermohydrogen Treatment of High Strength Beta Titanium Alloy Ti 10-2-3
P. Schmidt, V. Macin, H.-J. Christ (Germany)
- On the Influence of Tempering on Hydrogen Permeation in a 34CrMo4 Martensitic Steel
L. Moli-Sanchez, F. Martin, E. Leunis, M. Wery, J. Chêne (France, Belgium)
- Fatigue Behavior of Austenitic Stainless Steel Alloys Thermally Pre-charged in Gaseous Hydrogen
D. Matson, A. Saigal, C. San Marchi (USA)
- Molecular Dynamics Study of Influence of Hydrogen-Affected Lattice-Defects Energies on Deformation Behaviors of Alpha-Fe
R. Matsumoto, S. Seki, S. Taketomi, N. Miyazaki (Japan)
- Effect of Microstructure of Martensite on Hydrogen Embrittlement in 8Ni-0.1C Steel
T. Matsuoka, A. Shibata, N. Tsuji (Japan)

- Deformation and Fracture in Scandium Deuteride Films and Pillars
N. Moody, E. Hintsala, D. Adams, N. Yang, D. Kammler, W. Gerberich (USA)
- Cracking Thresholds and Fracture Toughness Properties of Tritium-Charged-and-Aged Stainless Steels
M. Morgan (USA)
- Hydrogen Behavior in Electrolytically Charged Aluminum Alloys
M. Nakano, G. Itoh, T. Tsutsumi (Japan)
- Hydrogen-Assisted Strain-Controlled Fracture: Implications for Measurement of the Fracture Threshold in Gaseous Hydrogen
K. Nibur, B. Somerday, C. San Marchi, M. Dadfarnia, P. Sofronis (USA)
- Kinetics and Mechanisms of Hydrogen Isotope Exchange over Solid Storage Media
S. Owens, T. Mays (UK)
- Hydriding of Uranium and Thermal Decomposition of Uranium Hydride at Low Hydrogen Pressures
G. Powell (USA)
- Analysis of Hydrogen Permeation in Microalloyed Steel TIG Welds
S. Serna, M. Miranda-Salgado, A. Molina, B. Campillo, H. López (México, USA)
- Determination of Hydrogen Evolution from Uranium by Thermal Conductivity
A. Stowe, G. Powell, J. Morrell (USA)
- Influence of Strain Rate on Hydrogen Embrittlement in Submicrocrystalline Ultra-Low Carbon Steel Produced by High-Pressure Torsion Straining
Y. Todaka, K. Morisako, R. Ueji, A. Otsuka, M. Umemoto (Japan)
- Stress Corrosion Cracking and the Effect of Hydrogen on Mechanical Properties of FeMn-TWIP Steels
F. Unterumsberger, M. Pohl (Germany)
- A Model to Predict the Hydrogen Effect on Crack Growth Rate in High-Strength Steels
L. Vergani, A. Sciuccati, C. Colombo (Italy)
- Effects of Coldwork and Sensitization on the Mechanical Properties of Type 304SS in High Pressure Hydrogen
K. Xu, J. Zhao, M. Rana, J. White (USA)
- Design Analysis of Composite Vessel for High-Pressure Hydrogen Stationary Storage
Z. Feng, J. Wang, W. Zhang, M. Jawad, F. Vossoughi (USA)

Modeling and Simulation II

- 11:00-11:20 AM Impurity-Induced Interfacial Decohesion
J. Bassani (USA)
- 11:20-11:40 AM Intergranular Decohesion Induced by Mobile Hydrogen in Iron: First-Principles Calculations
M. Yamaguchi, J. Kameda, K.-I. Ebihara, M. Itakura, H. Kaburaki (Japan)
- 11:40-12:00 PM A 3D Cohesive Modelling Approach for Hydrogen Embrittlement in Welded Joints of X70 Pipeline Steel
A. Alvaro, V. Olden, O. Akselsen (Norway)
- 12:00-12:20 PM Theoretical Study of the Co-adsorption of Hydrogen and Unsaturated Molecules on Iron Surface
A. Staykov, B. Somerday (Japan, USA)

Addressing Hydrogen Embrittlement in Technology II

- 7:00-7:30 PM Fundamental Studies on Tribology in Hydrogen
**Invited*
J. Sugimura (Japan)
- 7:30-7:50 PM Industrially-Relevant Multiscale Modelling of Hydrogen Embrittlement
N. Winzer, M. Mrovec, D. Di Stefano, I. Katzarov, A. Paxton (Germany, UK)
- 7:50-8:10 PM A Unified Modeling of Hydrogen Induced Cracking/Blistering in Steel Pipelines
A. Traidia, G. Lubineau, S. Duval, A. Sherik, M. Abufour (Saudi Arabia)
- 8:10-8:30 PM Determination of the Hydrogen Concentration in High Strength Steels After Phosphating Processes Using the Hydrogen Collecting Analysis (HCA) Technique
F. Unterumsberger, S.Kühn, *M. Pohl* (Germany)
- 8:30-8:50 PM *Break*

Hydrogen-Deformation Interactions

- 8:50-9:10 PM Nanomechanical Approach to Understand the Mechanism of the Hydrogen Embrittlement
A. Barnoush, M. Zamanzade, H. Vehoff (Germany)
- 9:10-9:30 PM Hydrogen Effects on Plastic Deformation of AISI 316LN Single Crystals
Y. Yagodzinsky, E. Malitckii, T. Saukkonen, H. Lankinen, H. Hänninen (Finland)
- 9:30-9:50 PM Interaction Hydrogen-Plasticity in the X14CrMo17 Ferritic Stainless Steel
V. Gaspard, D. Delafosse, A. Fraczkiewicz (France)
- 9:50-10:10 PM Influence of Hydrogen and Oxygen Content on the Mechanical Behavior of Zirconium Between 275 and 325°C and Titanium at 20°C
J. Couzinié, B. Barkia, V. Doquet, I. Guillot (France)