

July 1–6

Lisbon, Portugal

The Seventeenth (2007) International
Offshore (Ocean) and Polar Engineering Conference

**5th ISOPE HPM Symposium:
Nanomaterials for
Structural Application**

1st ISOPE Strain-Based Design Symposium

7th ISOPE Ocean Mining (& Gas Hydrates)
Symposium

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ISOPE-2007

Corinthia Lisboa Hotel
Lisbon Portugal; July 1–6

Technical Program

Refereed papers from **48** countries in **120** sessions and
7 plenary sessions

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TECHNICAL PROGRAM

The Seventeenth (2007) International Offshore and Polar Engineering Conference

Lisbon, Portugal, July 1–6, 2007

The number at end of the session title indicates the tentative number of the proceedings volume. Only the changes on titles or authors the ISOPE-2007 Technical Program Committee (TPC) received in writing before January 22, 2007 are reflected in this program. Paper titles in blue color are additions to the printed version of the technical program. Final corrections will be updated in the Conference Proceedings and the Final Program. Proceedings CD-ROM (ISBN 1-880653-68-0; ISBN 978-1-880653-68-5) will be available as a set of 4 volumes (3,600 pp. est.) from ISOPE during and after the Conference.

SUNDAY, July 1

Conference Reception

17:00

To Be Announced

MONDAY 09:00

1. OCEAN & ARCTIC INDUSTRY REVIEW (V. 1)

Monday July 2 09:00 Floriana

Chair: Langen, I, University of Stavanger, Norway

Co-Chair: Isaacson, M, University of British Columbia, Canada

Opening Address

Matsui, T, ISOPE President, USA.

Engineering Challenges Driven by the Navy and Navy after

Next [Oral presentation]

Gruber, P L, Office of Naval Research, USA

Subsea Development in the Ormen Lange Offshore Project

Eklund, T, Hydro Oil and Energy, Norway

Polar Rules: Are Harmonized Standards Good for Shipping?

Santos-Pedro, V, Transport Canada, Canada

East Siberian Pipeline: State and Development

Koff, GL, Russian Ministry of Emergency Situations/Rosstroy;

Bekker, AT, Far-Eastern State Technical Univ, Russia

Eurocode 8 – Design for Earthquake Resistance of Foundations

Séco e Pinto, P S, Univ of Coimbra /LNEC, Portugal

The 5th (2007) ISOPE HPM Symposium:
**Nanomaterials for
Structural Application**

at ISOPE-2007 Conference, Corinthia Lisboa Hotel
Lisbon, Portugal, July 1–6, 2007

6. HPM Symp: Nanomaterials I:
Applications 1 (V. 4)

Monday July 2 14:00 Opala I+II

Chair: Gruber, P L, Office of Naval Research, The Navy, USA
Co-Chair: Ying, J, Inst. of Bioeng. & Nanotech., Singapore

Introductory Remarks: Nanomaterials and Nanotechnology
Tsakalakos, T, Rutgers Univ, USA

Structural Aspects and Functional Properties of Nanostructures
Hahn, H, Inst. of Nanotechnology, Germany

Magnetic Properties of Nanomaterials
Niarchos, D, NCSR Demokritos, Greece

Functional Cluster-assembled Nanostructures for Applications to High Integration-density Devices
Perez, A, Mélinon, P, Dupuis, V, Masenelli, B, Bardotti, L, Prével, B, Tuailon-Combes, J, Bernstein, E, Tournus, F, Wang, I, Hannour, A, Nicolas, D, Raufast, C, Univ Claude Bernard Lyon, France

Nanostructured Materials for Electronics: Science & Engineering
Kislov, V, Inst of Radioengineering & Electronics, RAS, Russia

Nanotechnology of Electronic Materials: Principles, Processes, and Applications
Logothetidis, S, Aristotle Univ of Thessaloniki, Greece

Application of Synchrotron Methods in Nanomaterials
Croft, M, Rutgers Univ, USA

Electron Microscopy: Does It Solve Nano-materials Problems?
De Hosson, J T M, Univ of Groningen, The Netherlands

16. HPM Symp: Nanomaterials II:
Applications 2 (V. 4)

Monday July 2 16:20 Opala I+II

Chair: Niarchos, D, NCSR "Demokritos," Greece
Co-Chair: Hahn, H, Inst of Nanotechnology Karlsruhe, Germany

Energy and Nanomaterials: A Young Materials Scientist's Perspective
Lou, J, Rice Univ, USA

Application of Nanomaterials in Biomedicine
Muhammed, M, KTH, Sweden

Nanostructured Steel?
Morris, J W, Univ of California-Berkeley, USA

Processing and Applications of Nanostructured Ceramics
Kear, B H, Rutgers Univ; Mukherjee, A, Univ of California, Davis, USA

Nanoporous Materials
Kanellopoulos, N, NCSR-Demokritos, Greece

Irradiation Effects on Materials at Nanoscale Level

Simos, N, Brookhaven National Laboratory, USA

The Role of Amorphous Structure on Corrosion Resistance

Ayer, R, Ling, S, ExxonMobil Research & Engineering, USA

**26. HPM Symp: Nanomaterials III:
Synthesis & Processing 1 (V. 4)**

Tuesday July 3 08:00 Opala I+II

Chair: Ellis-Behnke, R, MIT, USA

Co-Chair: Kisllov, V V, Russian Academy of Sciences, Russia

Nanostructure Processing of Advanced Ceramics

Ying, J Y, Inst of Bioengineering and Nanotechnology, Singapore/MIT, USA

Single Wall Carbon Nanotube Thin Films

Chhowalla, M, Rutgers Univ, USA

Nanostructured Films and Particles by Sputtering and Solution Chemistry

Chow, G M, National Univ of Singapore, Singapore

Net-shaping of Nanopowders into Structural and Functional Parts

Khasanov, O, Dvilis, E, Sokolov, V, Milovanova, T, Tomsk Polytechnic Univ, Russia

Fe-based Bulk Glassy Alloy Composite Containing *in situ* Formed α -(Fe,Co) and (Fe,Co)₂₃B₆ Microcrystalline Grains

Shen, B L, Men, H, Inoue, A, Tohoku Univ, Japan

Dispersing Inorganic Nanoparticles – Keystep for Utilization

Pilotek, S, Schär, S, Steingröver, K, Tabellion, F, Buhler Partec, Germany

Recent Advances in Design and Processing of Nanomaterials for Solid-state Thermal-to-electric Energy Conversion

Huber, T, Howard Univ, USA

**36. HPM Symp: Nanomaterials IV:
Nanobiotechnology (V. 4)**

Tuesday July 3 10:30 Opala I+II

Chair: Muhammed, M, KTH, Sweden

Co-Chair: Gogotsi, Y, Drexel, USA

The Intersection of Nanotechnology and Medicine

Ellis-Behnke, R, MIT, USA

Nanotechnology and Medicine at Crossroads

Tsakalagos, T, Rutgers Univ, USA

Using UV Light to Biofunctionalize Material Surfaces with Micrometer Resolution

Petersen, S B, Aalborg Univ, Denmark

Nanostructured Coatings to Organize Proteins

Palmer, R E, Univ of Birmingham, UK

Structural Nanomaterials for the Regeneration of Numerous Tissues

Webster, T J, Brown Univ, USA

Chemical Processing and Applications of Magnetic Nanoparticles and Nanorods

Kurihara, L K, Naval Research Laboratory, USA

Target Oriented Drug Delivery Systems for Medical Treatments

Kim, D K, Keele Univ, UK

**46. HPM Symp: Nanomaterials V:
Mechanical Properties (V. 4)**

Tuesday July 3 14:00 Opala I+II

Chair: Vasudevan, A K, Office of Naval Research, The Navy, USA
Co-Chair: Mukherjee, A K, Univ of California-Davis, USA

Mechanical Characterization of Micro/nano Materials and Structures
Kujawski, D, Ghantasala, M K, Western Michigan Univ, USA

Quantifying the Nanomechanics of Nanostructured Materials
Mann, A B, Rutgers Univ, USA

Continuum Nanomechanics
Aifantis, E, Aristotle Univ of Thessaloniki, Greece

**Mechanical Spectroscopy and Nanophase Materials a Two Case Study:
Al-Mg-Si Alloys Prepared by Severe Plastic Deformation and Mg Based
Hydrides for Hydrogen Storage**
Bonetti, E, Univ di Bologna, Italy

Deformation of Nanowires
Aifantis, K, Ecole des Mines de Paris, France

**Comparison of Deformation and Failure Regularities of Ultrafine
Grained Crystalline Materials and Amorphous Metallic Alloys at
Cryogenic Temperatures**
Tabachnikova, E D, Bengus, V Z, B. Verkin Inst for Low Temperature
Physics and Engineering, Ukraine

**Mechanisms and Strategies to Achieve Simultaneous Strength and
Ductility in Bulk Nanostructured Materials**
Wang, Y M, Lawrence Livermore National Laboratory, USA

**56. HPM Symposium: Nanomaterials VI:
Synthesis & Processing 2 (V. 4)**

Tuesday July 3 16:20 Opala I+II

Chair: Ovid'ko, I, Russian Academy of Sciences, Russia
Co-Chair: Kanellopoulos, N, NCSR "Demokritos", Greece

**Principles of Producing Bulk Nanostructured Materials with Unique
Properties by Severe Plastic Deformation Techniques**
Valiev, R, Ufa State Aviation Technical Univ, Russia

Composite Materials and Coatings Using Detonation Nanodiamond
Mochalin, V, Behler, K, Gurga, A, Gogotsi, Y, Drexel Univ, USA

Iron Nanomaterials Prepared by Electrodeposition
Trudeau, M, IREQ, Canada

Processing and Properties of Hard Nanocrystalline Coatings
Jankowski, A, TTU Texas, USA

New Superhard Nanomaterials-based High-melting Point Compounds
Andrievskiy, R A, Inst of Problems of Chemical Physics, RAS, Russia

**Microstructure and Mechanical Properties of Nano-Meso Hybrid
Materials Fabricated by Hot Roll Sintering Process**
Ameyama, K, Ritsumeikan Univ, Japan

One-dimensional AlN Nanostructured Materials
Hu, Z, Nanjing Univ, China

**65. HPM Symposium: Nanomaterials VII:
Nanocoatings (V. 4)**

Wednesday July 4 08:00 Opala I-II

Chair: Jankowski, A, TTU Texas, USA

Co-Chair: Logothetidis, S, Aristotle Univ of Thessaloniki, Greece

Ceramic Nanocoatings: Possible Applications for the Oil and Energy Industry

Meyer, F, Faber, S, Nonninger, R, ItN Nanovation AG, Germany

Development of New Process for Deposition of Nanometallic Particles on WC for Thermal Spraying

Berget, J, Sallom, Z K, SINTEF Materials and Chemistry, Norway

Thin Hard-coated Components Fatigue Resistance: Numerical Models and Experimental Validation

Baragetti, S, Univ degli Studi di Bergamo, Italy

Nanostructured Coatings with Enhanced Properties for Gas Turbine Engine and for Gear Applications

Provenzano, V, National Inst of Standards and Technology, USA

Nanostructured Titanium Oxide Coating for Hydrometallurgical Application

Kim, G E, Perpetual Technologies, Canada

Shipboard Applications for Nanostructured Al₂O₃/13TiO₂ Plasma-sprayed Coatings

Rigney, R W, Brunhouse, Jr, A&A Company; B S, Kear B H, Rutgers Univ, USA

Residual Stress Distributions in Plasma Sprayed Nanostructured Ceramic Coatings

Shukla, V, Sadangi, R, Tsakalagos, T, Croft, M, Rutgers Univ; Zhong, Z, Brookhaven National laboratory; Rigney, R, Brunhouse, S, A&A Co., USA

**75. HPM Symposium: Nanomaterials VIII:
Nanocomposites (V. 4)**

Wednesday July 4 10:30 Opala I-II

Chair: De Hosson, J T M, Univ of Groningen, The Netherlands

Co-Chair: Chow, G M, National Univ of Singapore, Singapore

Processing and Characterization of Structural Nanoceramic Composites with Interesting Mechanical Properties

Mukherjee, A K, Jiang, D T, Hulbert, D, Thomson, K, Univ of California-Davis, USA

Nitride Based Ceramic Nanocomposites with Multifunctionality

Kusunose, T, Sekino, T, Niihara, K, Osaka Univ, Japan

Transparent Yttria-based Nanocomposites

Sadangi, R, Shukla, V, Kear, B H, Al Sharag, J, Rutgers Univ; Stefanik, T, Gentilman, R, Raytheon, USA

Nanocomposites of Transition Metal Dichalcogenides (Type WS₂) with C-based Phases

Cavalerio, A, Universidade de Coimbra, Portugal

Nanocomposite Porous Silicon Layers

Kleps, I, Miu, M, Ignat, T, Simion, M, IMT-Bucharest, Romania

Effect of Silica Fume Particles on the Mechanical Properties of High-performance Concrete

Nassif, H, Rutgers Univ, USA

Nanohybrid Thin Films of Highly Ordered TiO₂ Nanoparticle Arrays in PMMA by Diblock Copolymer Templating

Wang, J, National Univ of Singapore, Singapore

**85. HPM Symposium: Nanomaterials IX:
Characterization & Modeling (V. 4)**

Wednesday July 4 14:00 Opala I+II

Chair: Valiev, R, Ufa State Aviation Tech Univ, Russia

Co-Chair: Croft, M, Rutgers Univ, USA

Deformation and Fracture Mechanisms in Nanocrystalline Metals and Nanocomposite Ceramics

Ovid'ko, I A, Inst of Problems of Mechanical Engineering, RAS, Russia

Plastic Deformation of Nano-size Copper Specimens

Doyama, M, Kogure, Y, Nozaki, T, Teikyo Univ of Science and Technology, Japan

Yield Stress of Nanocrystalline Materials: Nanomechanics of Hall-Petch Relationship

Pande, C S, Naval Research Laboratory, USA

Discreteness of Nanostructures and Critical Sizes of Nanoclusters

Suzdalev, I, Maksimov, Y, Inst of Chemical Physics, RAS, Russia

In-situ TEM Study of the Characteristics in Nanometer-sized Alloy Particles

Lee, J G, Lee, J H, Korea Inst of Machinery & Materials, Korea; Mori, H, Osaka Univ, Japan

Transparent Conducting Oxides: from Materials to Applications

Kiriakidis, G, Univ of Crete and FORTH, Greece

Preparation, Characterization and Applications of Electroplated Composite Coatings

Lupu, N, R&D for Tech Phys, Romania

Strain Mapping of Fatigue Cracks in Aluminum Alloys: Transient and Environmental Effects

Fremy, F, ENS-Cachan, France; Sadangi, R, Shukla, V, Tsakalagos, T, Croft, M C, Rutgers Univ; Pao, P, Naval Research Laboratory; Vasudevan, A K, Office of Naval Research; Lee, E, Navair; Zhong, Z, Brookhaven National Laboratory, USA

FRIDAY July 6

Tours: Lisbon and Portugal

Make advance reservation: www.semlimite.pt

About Lisbon: www.atl-turismolisboa.pt

Find further details inside the program and www.isopec.org .

HOTEL RESERVATION FORM (must use this form)

Corinthia Lisbon Hotel (5-star), July 1–6, 2006

Corinthia Lisbon Hotel (5 stars) is the official venue for the Conference. If making your reservation at ISOPE room rate without this form, you must indicate that reservations are for the *ISOPE Conference*. In order to have your room guaranteed, this reservation form with **one (1)** night's deposit must be received **via either fax or mail** only and **no later than April 1, 2007** by (and also confirmation via fax or email by):

Group Reservation (ISOPE-2007): maria.costa@corinthia.pt

Corinthia Lisbon Hotel: Fax: +351-217-236-364

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1099-031 Lisboa, Portugal

No reservations will be considered **without credit card** and signature

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Surname: _____ & Middle: _____

Circle: Male Female; Title Mr. Ms. Mrs. Prof. Dr.

Company: _____

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_____ City _____

Country _____ Postal (ZIP) Code _____

Fax No. _____; Email _____

Arrival: _____ Time _____; Depart.: July __, Time _____

Room Choice*: Single/Double No of Rooms (*and Circle One*)

Classic Single €105 ___ Sgl / Dbl / ___ Twin**

Classic Double €125 ___ Sgl / Dbl / ___ Twin**

Supplem Exec Extra €50 ___ Sgl / Dbl / ___ Twin**

“Supplementary Exec” is Executive Room with €50 extra charge.

* Rates include VAT of 5% (subject to change) and breakfast.

** Name of the person to share: _____

Advance Deposit and Methods of Payment. Please enclose **one (1)** night's non refundable deposit per room. **Cancellations** received within 1 week before arrival and no-shows will be assessed **the total number of** nights booked.

I am enclosing an international money order or check of € _____ in euro drawn on a EU bank, payable to **Corinthia Lisboa Hotel**.

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Diner's Club American Express JCB

Card no.: _____ 3- or 4-digit code _____

Name on card: _____ Exp. Date: _____

Signature: _____ Date: _____, 2007

**Copy, Complete, and Send This Form with One-Night's Deposit
Directly to Corinthia Lisbon Hotel.** as addressed above.
Reservation by either fax or e-mail only.

Reservation after **April 1** is subject to room availability.

In case Corinthia Hotel is fully booked before April 1, click on
www.semlimite.pt to find other hotel choices available