

Program

Nanoparticles from the Vapor Phase Synthesis with Chemical and Biochemical Applications

August 8-13, 2004

**Davos Conference Center (Kongresszentrum)
Davos, Graubunden, Switzerland**

Conference Chairs

**M. Samy El-Shall
Virginia Commonwealth University, USA**

**Andreas Schmidt-Ott
Delft University of Technology, The Netherlands**

ECI

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Gesellschaft für Aerosolforschung (GAeF)

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Sunday, August 8, 2004

17:00 – 19:00	Registration (Cresta Sun Hotel)
18:00 – 19:30	Welcome Reception
19:30 – 21:00	Dinner
21:00 – 22:00	Social Hour

Notes

- ? Lunches and dinners will be at the Cresta Sun Hotel.
- ? All technical sessions will be at the Congress Center.
- ? All poster sessions will be at the Congress Center.
- ? No smoking at ECI conference technical or social functions.
- ? Internet corner is for use of all our participants – please limit your time on-line if others are waiting.
- ? Please turn cellular telephones to vibrate and conduct telephone conversations outside the meeting room.

Monday, August 9, 2004

07:00 – 08:30 Breakfast Buffet

08:45 – 09:00 **Opening Remarks**

Samy El-Shall, Conference Chair
Herman Bieber, ECI Liaison

09:00 – 09:50

Plenary

Chair: *Samy El-Shall*

1. Clusters: Building Blocks for Materials of Selected Properties

A. W. Castleman, Jr., Pennsylvania State University, University Park, USA

Clusters, Nucleation & Cluster Assembled Materials

Chair: *Michael Zachariah*

09:50 – 10:25

2. Generation of Active Metal-Oxide Clusters in a High-Pressure Flow-Reactor

Robert L. Whetten, Georgia Institute of Technology, USA

10:25 – 11:00

3. Cluster Assembly in Ultra-High Vacuum

René Reichel, University of Canterbury, New Zealand

11:00 – 11:30

Coffee Break

11:30 – 12:05

4. Stable Cluster Motifs for Nanoscale Materials

S. N. Khanna, Virginia Commonwealth University, USA

12:05 – 12:40

5. Nanoscale Clusters and Molecular Orbital Interactions in Macromolecule-Metal Complexes

Laurence A. Belfiore, Colorado State University, USA

13:00 – 14:15

Lunch

14:15 – 16:30

Ad hoc Sessions / Free Time

17:00 – 17:30

Afternoon Coffee

Nanoparticle Synthesis & Processes I

Chair: *Pratim Biswas*

17:30 – 18:05

6. Synthesis and Reactivity of Energetic Nanoparticles

Michael R. Zachariah, University of Maryland and NIST, USA

18:05 – 18:40

7. Functional Nanoparticles by Flame Spray Pyrolysis

Lutz Madler, ETH Zurich, Switzerland

18:40 – 19:15

8. Flame Spray Pyrolysis of Silver Nanoparticles

Lu Zhang, DuPont Central R&D, USA

Monday, August 9, 2004 (continued)

19:15 – 19:50

9. Industrial Production of Nano-Scaled Metal Oxides

Frank Menzel, Hanau, Germany

20:15 – 21:30

Dinner

21:30 – 22:30

Social Hour

Tuesday, August 10, 2004

07:00 – 08:45 Breakfast Buffet

Nanoparticle Synthesis & Processes II

Chairs: *Volker Hilarius and Bertrum Diemer*

09:00 – 9:35

10. Thermodynamic Controlled Gas Phase Process for the Synthesis of Nickel Nanoparticles of Adjustable Size and Morphology

Th. Kauffeldt, University Duisburg-Essen, Germany (Invited and supported by GAeF)

9:35 – 10:10

11. One-Step Synthesis and Deposition of Nanostructured Titania Films and Particles

Jorma K. Jokiniemi, VTT Processes, Finland

10:10 – 10:45

12. The Morphology and Directed Self Assembly of Quantum Dots on Surfaces

P. W. Voorhees, Northwestern University, USA

10:45 – 11:15

Coffee Break

11:15 – 11:50

13. The Microwave Plasma Process – A Versatile Process to Synthesize Nanoparticle Materials

Dieter Vollath, Nano Consulting, Stutensee, Germany (Invited and supported by GAeF)

11:50 – 12:25

14. Production and Surface Functionalization of Macroscopic Quantities of Brightly Photoluminescent Silicon Nanoparticles and Magnetic Metal Nanoparticles

Mark T. Swihart, University at Buffalo (SUNY), USA

12:45 – 14:00

Lunch

14:00 – 17:00

Ad hoc Sessions / Free Time

16:30 – 17:00

Afternoon Coffee

Nanoparticle Synthesis & Processes III

Chair: *Sean Garrick*

17:00 – 17:35

15. Synthesis and Growth of Doped Titanium Dioxide Nanoparticles

Pratim Biswas, Washington University, St. Louis, USA

17:35 – 18:10

16. Spray Pyrolysis of Multicomponent Oxide Powders Opportunities and Limitations

Volker Hilarius, Darmstadt, Germany

18:10 – 18:45

17. Oxide-Based Composite Nanoparticles by Laser Pyrolysis: Growth Process and Applications

C. Reynaud, CNRS URA, France

Tuesday, August 10, 2004 (continued)

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|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 18:45 – 19:20 | 18. Synthesis of Magnetic Nanoparticles by Pulsed Plasma CVD
<i>Isao Matsui, Japan Chemical Innovation Institute, Japan</i> |
| 19:20 – 19:55 | 19. Nanostructured Cobalt Oxide Films for Optical CO Sensing Fabricated by Pulsed Laser Deposition
<i>Naoto Koshizaki, National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan</i> |
| 20:15 – 21:30 | Dinner |
| 21:30 – 22:30 | Social Hour |

Wednesday, August 11, 2004

07:00 – 09:00 Breakfast Buffet

Catalysis on Nanoparticles

Chairs: *Robert Whetten and Jacki Ying*

09:00 – 9:35 **20. Alloy Nanoparticles and Nanoparticle Catalysts from the Vapor Phase: Synthesis, Characterization and Catalytic Activity**
M. Samy El-Shall, Virginia Commonwealth University, USA

9:35 – 10:10 **21. Influence of the Dispersion State of Ni Nanoparticles on their Catalytic Behavior in the Methanation Reaction: Gas-borne vs. Supported Nanoparticles**
Alfred P. Weber, University of Karlsruhe, Germany (Invited and supported by GAeF)

10:10 – 10:45 **22. TiO₂ and Pt/TiO₂ Nanoparticle Synthesis by Flame Spray Pyrolysis – Applications in Photocatalysis**
Donia Beydoun, University of New South Wales, Sydney, Australia

10:45 – 11:15 Coffee Break

11:15 – 11:50 **23. A New Concept to Perform Gas Phase Processes using an In-Situ Formed Quasi Steady- State High Active Catalytic Surface on a Nanometer Scale**
E. Kauffeldt, University Duisburg-Essen, Germany (Invited and supported by GAeF)

11:50 – 12:25 **24. Preparation and Characterization of Cu/CeO₂ Catalysts for CO Oxidation**
Sarojini Deevi, Research Center, Philip Morris, USA

12:25 – 13:00 **25. Flame-Assisted Synthesis of Nano-Materials for Catalytic Applications**
Tue Johannessen, Technical University of Denmark, Denmark (Invited and supported by GAeF)

13:15 – 14:30 Lunch

15:30 – 17:30 **Poster Session** & Afternoon Coffee

Bio-Applications of Nanoparticles

Chair: *Kikuo Okuyama*

17:30 – 18:05 **26. Nanostructure processing of Advanced Catalytic and Biomaterials**
Jacki Y. Ying, Singapore Science Park, Singapore

18:05 – 18:40 **27. Inorganic Nanoparticles: Cytotoxicity and Targeted Drug Delivery**
Gan-Moog Chow, National University of Singapore, Singapore

Wednesday, August 11, 2004 (continued)

18:40 – 19:15

28. Novel Magnetic Core-Shell Nanoclusters for Biomedical Applications

You Qiang, University of Idaho, USA

19:15 – 19:50

29. Engineering of Nanoparticles Surfaces for Biomedical Applications

Mamoun Muhammed, Royal Institute of Technology, Sweden

20:15 – 21:30

Dinner

21:30 – 22:30

Social Hour

Thursday, August 12, 2004

07:00 – 08:45 Breakfast Buffet

Characterizations, Basic Properties & Applications

Chair: *Andreas Schmidt-Ott*

9:00 – 09:35 **30. Ferroelectricity in Free Metal Clusters: A Precursor to Superconductivity**

Walt A. de Heer, Georgia Institute of Technology, USA

09:35 – 10:10 **31. Aerosol production of Monodisperse Nanoparticles for Catalytic Applications and Their Electrical Mobility**

Albert G. Nasibulin, Helsinki University of Technology, Finland

10:10 – 10:45 **32. Size-Dependent Properties of Laser Synthesized Monodisperse Nanoparticles**

Takafumi Seto, National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan

10:45 – 11:20 **33. On-Line Measurement of Ultrafine Aerosol particles**

Heinz Burtscher, University of Applied Sciences, Aargau, Switzerland

11:30 – 16:00 Optional Excursion (Sertig Valley – picnic lunch, short hike to triple waterfall; famous Landwasser viaduct near Wiesen with pedestrian access)

16:00 – 16:30 Afternoon Coffee

Semiconductors & Carbon Nanotubes

Chair: *Mamoun Muhammed*

16:30 – 17:05 **34. Nanocomposites between N-Type and P-Type Semiconductors: Towards A New Generation of Solar Cells**

Albert Goossens, Delft University of Technology, The Netherlands (Invited and supported by GAeF)

17:05 – 17:40 **35. Single Walled Carbon Nanotube Synthesis by a Novel Aerosol Method**

Esko I. Kauppinen, Helsinki University of technology and VTT Processes, Finland

17:40 – 18:15 **36. Nucleation and Growth of Single-Walled Carbon Nanotubes on Co-Mo Catalysts**

Daniel E. Resasco, University of Oklahoma, USA

18:15 – 18:50 **37. Nanoparticles As Catalysts for Carbon Nanotube Synthesis**

Oliver Jost, Institute of Materials Science, Dresden, Germany

18:50 – 19:25 **38. Nanostructured Manganese Oxide Catalyst Prepared by Pulsed Laser Ablation**

Nobuyasu Suzuki, Matsushita Electric Industrial Co., Ltd, Japan

20:00 – 23:00 Conference Banquet

Friday, August 13, 2004

07:00 – 08:45 Breakfast Buffet

Particle Synthesis & Modelling

Chairs: *Mark T. Swihart and Frank Menzel*

09:00 – 9:35 **39. Spark discharge, a process of nanoparticle production through extremely fast quenching**
A. Schmidt-Ott and M. Ullmann, Delft University, The Netherlands

9:35 – 10:10 **40. Powder Nanofunctionalization through Spray Route Assembling of Nanoparticles**
Kikuo Okuyama, Hiroshima University, Japan

10:10 – 10:45 **41. Composite and Mixed-Oxide Nanoparticles from Atmospheric Flame Synthesis**
Vital Andri, Swiss Federal Institute of Materials Testing and Research, Switzerland

10:45 – 11:15 Coffee Break

11:15 – 11:50 **42. Aerosol Reactors for Nanoparticle Synthesis and Hydrogen Production**
Sotiris Pratsinis, ETH Zurich, Switzerland

11:50 – 12:25 **43. Nanoparticle Nucleation in Turbulent Shear Flows**
Sean C. Garrick, University of Minnesota, USA

12:25 – 13:00 **44. Bivariate Population Balances for Nanopowder Synthesis**
R. Bertrum Diemer, Jr., DuPont Engineering, USA

13:00 – 13:20 **Closing Remarks**
Andreas Schmidt-Ott

13:30 – 14:30 Lunch

14:30 Departure

Poster Session

Chairs: *Samy El-Shall and Andreas Schmidt-Ott*

Wednesday, August 11, 2004

3:30 – 5:30 PM

1. Nanoparticles in Astrophysics

M. Samy El-Shall, Virginia Commonwealth University, USA

2. Catalytic Iron Nanoparticle Evolution in Hot Wall Carbon Nanotube Reactors

David P. Brown, Florida, USA

3. Surface Modification of Magnetic Nanoparticles using Gum Arabic

Darryl N. Williams, University of Maryland, College Park, USA

4. Thermal and Mechanical Properties of Hydroxy Polyimide-Silica Nano Composites

Amal Al Arbash, Department of Chemistry, Kuwait University, State of Kuwait

5. Dynamic Loading of Beams Made of Layered Composites with Defects of Delamination Type

G. H. Murzakhanov, Technical University, Moscow, Russia

6. The Influence of the Process Parameters on the Silicon Nanoparticles Production by Laser Ablation

Constantin Grigoriu, National Institute for Laser, Plasma and Radiation Physics, Romania

7. Chemical and Biochemical Applications

Jaiyeola Victor Oluwaseun, Ibadan, Nigeria

8. Preparation of ITO Nanoparticles by a Low-Pressure Spray Pyrolysis Method and their Characteristics

Takashi Ogi, Hiroshima University, Japan

9. Suppression of Particulate Contamination for a PECVD Process by Using a New Type of Modulating Plasma

Manabu Shimada, Hiroshima University, Japan

10. Nanoparticle Synthesis in an Atmospheric Pressure Plasma Jet

Andreas Schmidt-Ott, Delft University of Technology, The Netherlands

11. Facile Generation of Ultra-Stable Larger Vanadium Oxide Clusters: Adsorption Capabilities for Catalytic Applications

Richard B Wyrwas, Jr., Georgia Institute of Technology, USA