
Workshop Directors:
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PURPOSE OF THE WORKSHOP
The ability to synthesize and to manipulate nanoscale building blocks from the gas-phase promises to lead to fundamentally new advances in materials science and engineering and to exciting opportunities for innovation in technology. Cluster beam and aerosol technologies are now being used to produce and assemble nanoparticles. The integration and cross-fertilization of these two approaches, which, to a large extent have evolved independently, will stimulate the development of novel scientific and technological solutions and performances unattainable with other nanotechniques. The aim of this workshop is to bring together both junior and senior scientists belonging to the cluster-beam and the aerosol communities in order to exchange experiences and new ideas, and to favour the establishment of a common language for novel experimental and theoretical approaches.

The goal is to develop integrated methods for the study of nanoparticles produced in the gas-phase in order to identify the critical parameters affecting the synthesis of nanostructured materials and the manufacturing of nanostructured devices.

The workshop will focus on the following topics: Nanoparticle design, production, assembling and process technology, Isolated nanoparticle characterization, Cluster-surface interactions, Nanostructured magnetic systems, Nanostructured and Nanocomposite films, Advanced fabrication and characterization techniques, Modelling and simulation of cluster assembling. A Hot Topics session and a Poster session will provide the opportunity for all participants to exchange the results of their work.
The workshop was held between July 26th and August 1st 2003 with almost all of the participants being present for the whole period and attending all the sessions. One of the main objectives of the conference was the merging of two different communities, namely the Aerosol Technology and the Cluster Physics communities on the basis of a common interest for nanostructured materials grown by assembling gas-phase generated nanoparticles. The central idea was that both communities lack of awareness that they are dealing with very similar systems and that is very important to address this point as looking at the same system with different eyes and having an opportunity to share ideas could bring a strong cross-fertilization to both fields. This idea was clearly understood and enthusiastically accepted and shared by a vast majority of the participants as explicit in public remarks and private communications to the organizers.

The long time given to oral presentations has proven to be beneficial for the achievement of the highest understanding of the presented materials and results by all the participants, despite of the belonging to different scientific communities. This was also evident from the large number of questions and comments following all the contributions. Time available for discussions was also satisfactorily long enough.

The lunch break was long enough to have short meetings in restricted groups for scientific discussions or to set up plans for future collaboration. The workshop location in a small isolated village was also a good point for the stimulation of such meetings. This was one point appreciated by all the participants.

The composition of the group of participants was only slightly unbalanced by a majority of people coming from EU countries (60%). Non EU participants Were mostly coming from Japan (about 17%), followed by USA (about 13%) and Switzerland (about 9%). Among the EU countries Italy was the most represented.
PROGRAM

26 July  Arrival and accommodation

27 July  9.15-9.40  Presentation of the workshop
         9.40-10.30 J. Fernandez de la Mora: Inertial concentration of particle beams
                       (keynote lecture)
         10.30-11.00 Break
         11.00-12.00 J. Fernandez de la Mora: Inertial concentration of particle beams
                       (keynote lecture)

         16.30-17.20 A. Perez: Cluster assembling of magnetic nanostructures (keynote
                       lecture)
         17.20-17.50 Break
         17.50-18.40 A. Perez: Cluster assembling of magnetic nanostructures (keynote
                       lecture)
         18.40-19.30 S. Girshick: Deposition of nanostructured material by hypersonic
                       plasmas and focused particle beams (adv. seminar)

28 July  9.00-9.50 P. Milani: Supersonic cluster beam deposition (keynote lecture)
         9.50-10.20 Break
         10.20-11.10 P. Milani: Supersonic cluster beam deposition (keynote lecture)
         11.20-12.30 J. Akedo: Aerosol deposition method (ADM) for formation of
                       nanocrystalline films: high speed ceramic coating with fine particle jets
                       and applications to microdevices (adv. seminar)

         16.00-16.50 Poster session
         16.50-17.20 Break
         17.20-19.00 Poster session

29 July  9.00-9.50 H. Fissan: Structured deposition of nanoparticles in the gas phase
         on flat substrates (keynote lecture)
         9.50-10.20 Break
         10.20-11.10 H. Fissan: Structured deposition of nanoparticles in the gas phase
                       on flat substrates (keynote lecture)
         11.30-12.30 S. Fantechi: Nanotechnology and nanosciences, knowledge-based
                       multifunctional materials, new production processes and devices: research
                       priorities, instruments for support and possibilities for international co-
                       operation (adv. seminar)

         Afternoon  Excursion

30 July  9.00-9.50 W. Eberhardt: Spectroscopic characterization of gas phase and
         supported nanoparticles (keynote lecture)
         9.50-10.20 Break
         10.20-11.10 W. Eberhardt: Spectroscopic characterization of gas phase and
                       supported nanoparticles (keynote lecture)
         11.30-12.30 R. Flagan: Aerosol nanoparticles in microelectronic devices (adv.
                       seminar)
16:30-17:20 M. Johnston: Mass spectrometry of gas phase nanoparticles (keynote lecture)
17:20-17:50 Break
17:50-18:30 M. Johnston: Mass spectrometry of gas phase nanoparticles (keynote lecture)

31 July
9:00-9:50 H. Hahn: Gas phase chemistry for nanoparticle formation and functionalization (keynote lecture)
9:50-10:20 Break
10:20-11:10 H. Hahn: Gas phase chemistry for nanoparticle formation and functionalization (keynote lecture)
11:20-12:30 M. Hou: Theory and simulation of nanoparticle assembling (adv. seminar)
16:00-17:20 Hot topic session (15+5 minute talks)
17:20-17:50 Break
17:50-19:30 Hot topic session (15+5 minute talks)

1 August
9:00-9:50 S. Iannotta: Supersonic molecular beam epitaxy of organic materials (adv. seminar)
9:50-10:20 Break
10:20-11:10 R.E. Palmer: Cluster films for physics, chemistry and biology (adv. seminar)
11:15-12:00 Concluding remarks
“Hot-Topics” session

SiC thin films from deposition of hyperthermal C60 beams on Silicon
R. Verucchi
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Preparation and characteristics of core-shell clusters using two cluster sources
K.Sumiyama, R.Kato, T.Hihara and D.L.Peng
Department of Materials Science and Engineering, Nagoya Institute of Technology, Nagoya, Japan

Fabrication and Device Application of Nanocrystalline Silicon Particles
Shunri Oda
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Spontaneous Ordering Processes of Silicon Clusters
Synthesized on An Amorphous Carbon Film
Y. Iwata, M. Oki, M. Muto, H. Yamauchi, H. Matsuhata, S. Okayama, and T. Sawada
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Isomer selective spectroscopy on small metal clusters
C. Sieber, W. Harbich, J. Buttet, Ch. Félix
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Au, clusters deposited on atomically flat surfaces, a scanning tunneling microscopy study
E. Janssens, N. Vandamme, C. Van Haesendonck, and P. Lievens,
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Carbon Particles as Grown from Matrix Isolated Linear and Cyclic Carbon Clusters
Tomonari Wakabayashi, Hiromichi Kataura, and Wolfgang Krätschmer
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Surface Nanostructuring by Low-Energy Impact of Cluster Ions Formed from Gaseous Precursors
V.N. Popok, S.V. Prasalovich and E.E.B. Campbell
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