

International summer workshop  
**NANOSCIENCE *meets* METROLOGY:**

size and shape engineering of nanoparticles  
*towards improved technologies for energy, environment and health*

27<sup>th</sup>-31<sup>st</sup> July 2015, Erice - Sicily (Italy)  
Ettore Majorana Foundation and Centre for Scientific Culture

organized by the



EU/FP7 project  
[www.setnanometro.eu](http://www.setnanometro.eu)

with the participation and sponsoring of



## PROGRAMME

**MONDAY, July 27**

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17:00-18.00		Registration (venue: Majorana Foundation)
18:00 – 18:15		Opening remarks
18:15-19:15	R. Comparelli	PL: Colloidal nanocrystals at work: original opportunities for functional materials

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**20:00 WELCOME DINNER**

## TUESDAY, July 28

### Session 1: Preparation of nanoparticles

09:00-09:15	V. Maurino	(SetNanoMetro WP leader) Welcome and introductory remarks
<b>09:15 – 10:00</b>	<b>C. Chaneac</b>	<b>KN: Design of metal oxide nanoparticles using soft chemistry</b>
10:00 – 10:20	J. Jupille	Flexible Oxide Surface
10:20 – 10:40	S. Stankic	Controlling defects in ZnO nanoparticles
10:40 – 11:00	M. Blanco	Synthesis of TiO <sub>2</sub> nanoparticles with controlled characteristics by sol-gel technology
<b>11:00 – 11:30</b>		<i>Coffee Break</i>
11:30 – 11:50	R. Isopescu	Modelling the discontinuous TiO <sub>2</sub> anatase crystals' growth in hydrothermal synthesis
11:50 – 12:10	V. Maurino	Experimental approaches and paradigms for shape controlled synthesis of TiO <sub>2</sub> nanoparticles
12:10 – 12:30	M. Kahn	Oxidation route determines the magnetic and relaxivity properties of iron oxide nanocrystals: toward highly efficient MRI contrast agent
12:30 – 12:50	B. Bonelli	Isomorphic substitution versus oxide nanoclusters formation in iron-doped alumino-silicate nanotubes of the imogolite type

**13.00 - 14.30 LUNCH**

### Session 2: Preparation and characterization of nanostructured films

14:30 – 14:45	M. Blanco	(SetNanoMetro WP leader) Welcome and introductory remarks
<b>14:45 – 15:30</b>	<b>R. Moreno</b>	<b>KN: Design of nanostructured titania thin and thick coatings through colloidal processing</b>
15:30 – 15:50	A. Bonnefond	Synthesis of hybrid acrylic/TiO <sub>2</sub> films and their use in bacterial and pollutant degradation
15:50 – 16:10	N. Destouches	Photon-driven self-organized growth of metallic nanoparticles in TiO <sub>2</sub> films
16:10 – 16:30	L. D'Ortenzi	Silicon nanowires fabrication by supramolecular self-assembly and metal assisted catalytic etching
<b>16:30-17:00</b>		<i>Coffee Break</i>
17:00 – 17:20	E. Ortel	Determination of thin film porosity by SEM/EDX: application to mesoporous TiO <sub>2</sub> layers
17:20 – 17:40	W. Österle	Mesoscale modelling of the stress-strain and sliding behavior of a polymer matrix composite based on epoxy and 6 vol% silica nanoparticles

## WEDNESDAY, July 29

### Session 3: Characterization and metrology of nanoparticles

09:00-09:15	D. Hodoroaba	<i>(SetNanoMetro WP leader)</i> Welcome and introductory remarks
<b>09:15 – 10:00</b>	<b>W. Bremser</b>	<b>KN: Metrology on the nano scale: principles and challenges</b>
10:00 – 10:20	P. Esposito	A “Raman caliper” for size characterization of TiO <sub>2</sub> nanoparticles: exploitation of phonon-confinement effects on Raman spectra
10:20 – 10:40	E. Ortel	Shape recognition of nanoparticles by high-resolution SEM and TSEM
10:40 – 11:00	G. Spoto	Effect of shape controllers on the surface structure of engineered nanoparticles: investigations with molecular resolution
<i>11:00 – 11:30</i>		<i>Coffee break</i>
11:30 – 11:50	J. Mielke	Evaluation and comparison of particle sizing techniques within the EC/FP7 project <i>NANODEFINE</i>
11:50 – 12:10	S. Rades	Automated analysis of nanoparticles by high-resolution transmission scanning electron microscopy and energy dispersive X-ray spectroscopy
12:10 – 12:30	F. Bertolotti	Disclosing the structural, stoichiometric and morphological features of lead chalcogenide quantum dots through X-ray total scattering techniques

**13.00 - 14.30 LUNCH**

### Networking, Poster Session, Working time SETNanoMetro Consortium

14:30-15:30	networking activity	<b>Round table</b> with the representative of EU projects present at the workshop <i>(Moderator: A. Rossi, Coordinator of SETNanoMetro)</i>
15:30 – 15:40	J. Jupille	<i>(Researcher Emeritus of the SETNanoMetro Consortium)</i> Introduction to the Poster Session
<b>15:40 – 16:40</b>		<b>Poster Session</b>
<i>16:40 – 17:00</i>		<i>Coffee break</i>
<i>17:00 – 18:00</i>		Working time of the SETNanoMetro Consortium

**20:00 WORKSHOP DINNER**

## THURSDAY, July 30

### Session 4: Nanoparticles, films & light: energy and imaging

09:00-09:15	F. Oswald	(SETNanoMetro WP leader) Welcome and introductory remarks
<b>09:15 – 10:00</b>	<b>R. Demadrille</b>	<b>KN: Preparation of metal oxides electrodes and organic sensitizers for fabrication of efficient dye-sensitized solar cells</b>
10:00 – 10:20	A. Giovannozzi	Bare and silica-covered gold nanoparticles: a suitable tool for pesticide detection through Raman spectroscopy
10:20 – 10:40	G. Martra	Hybrid fluorescent dye-silica nanoparticles: toward a possible molecular engineering
10:40 – 11:00	F. Oswald	Industrial development of dye sensitized solar cells
<i>11:00 – 11:30</i>		<i>Coffee break</i>

### Special Session: Standardization and Equipments

11:30 – 11:40	A. Rossi	(SETNanoMetro Coordinator) Welcome and introductory remarks
11:40 – 12:00	M. Schmitt	Standardization in the area of nanotechnology
12:00 – 12:20	D. Sali	Innovative solutions for demanding FT-IR applications (Bruker)
12:20 – 12:40	G. Casassa	A new approach to Raman imaging: moving from spectra to images (Thermofisher)

## 13.00 - 14.30 LUNCH

### Session 5: Nanoparticles, films & light: photocatalysis

14:30 – 14:45	K. Dirscherl	(SETNanoMetro WP Leader) Welcome and introductory remarks
<b>14:45 – 15:30</b>	<b>T. Reenberg</b>	<b>KN: Photocatalysis: going from the lab to the roof</b>
15:30 – 15:50	S. Davidsdottir	Photocatalytic properties of TiO <sub>2</sub> nanoparticles
15:50 – 16:10	F. Pellegrino	Influence of the aggregation on the photocatalytic activity of TiO <sub>2</sub> nanoparticles
16:10 – 16:30	A.T. Rosell	Establishing traceability in Kelvin probe measurements for photocatalytic surfaces
<i>16:30 – 17:00</i>		<i>Coffee break</i>
17:00 – 17:20	R. Ambat	Investigation on photocatalytic TiO <sub>2</sub> coatings produced by magnetron sputtering process
17:20 – 17:40	F. Parrino	TiO <sub>2</sub> based inorganic-organic hybrid photocatalysts for highly selective alcohol partial oxidation
17:40 – 18:00	C. Ania	Tuning the photochemical activity of carbon nanoparticles: nanoconfinement and surface chemistry

FRIDAY, July 31

SESSION 6: Nanoparticles, films & health: safety and toxicity

09:00-09:15	I. Gibson	(SetNanoMetro WP leader) Welcome and introductory remarks
9.15-10.00	W. de Jong	<b>KN: Nanotechnology in medical devices: horizon scan, risk assessment and regulatory developments</b>
10.00-10.20	L. Iannarelli	Bio-accumulation of TiO <sub>2</sub> nanoparticles in caenorhabditis elegans: an in-vivo model for toxicity analysis
10.20-10.40	F. E.Imrie	Chick models for in vivo screening of nano-sized TiO <sub>2</sub> particles and other biomaterial nanoparticles
10.40-11.00	J. Kolling	Nanotoxicological assessment of shape-engineered titanium dioxide nanoparticles
11.00-11.30		Coffee break
11.30-11.50	A. Tampieri	New magnetic bio-resorbable nanosystems as a smart tool for advanced cell therapy
11.50-12.10	A. Marucco	The role of illumination in the hazard assessment of nano- TiO <sub>2</sub>
12.10-12.30	S. Ortelli	Control of nanotitania surface photoreactivity to address safety issues
12.30-13.00		Concluding remarks

