



Università
Ca' Foscari
Venezia

Ca' Foscari University of Venice

Prof. Agostino Cortesi
Dipartimento di Informatica

Cracow, January 29, 2010



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Ca' Foscari and the City of Venice

Venice is a crossroads of exchange and international contacts, of languages from all corners of the world, and of trade – it is both tradition and modernity.

It offers a unique experience that creates unforgettable cultural inspiration.





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Locations

Faculty of Economics
- San Giobbe



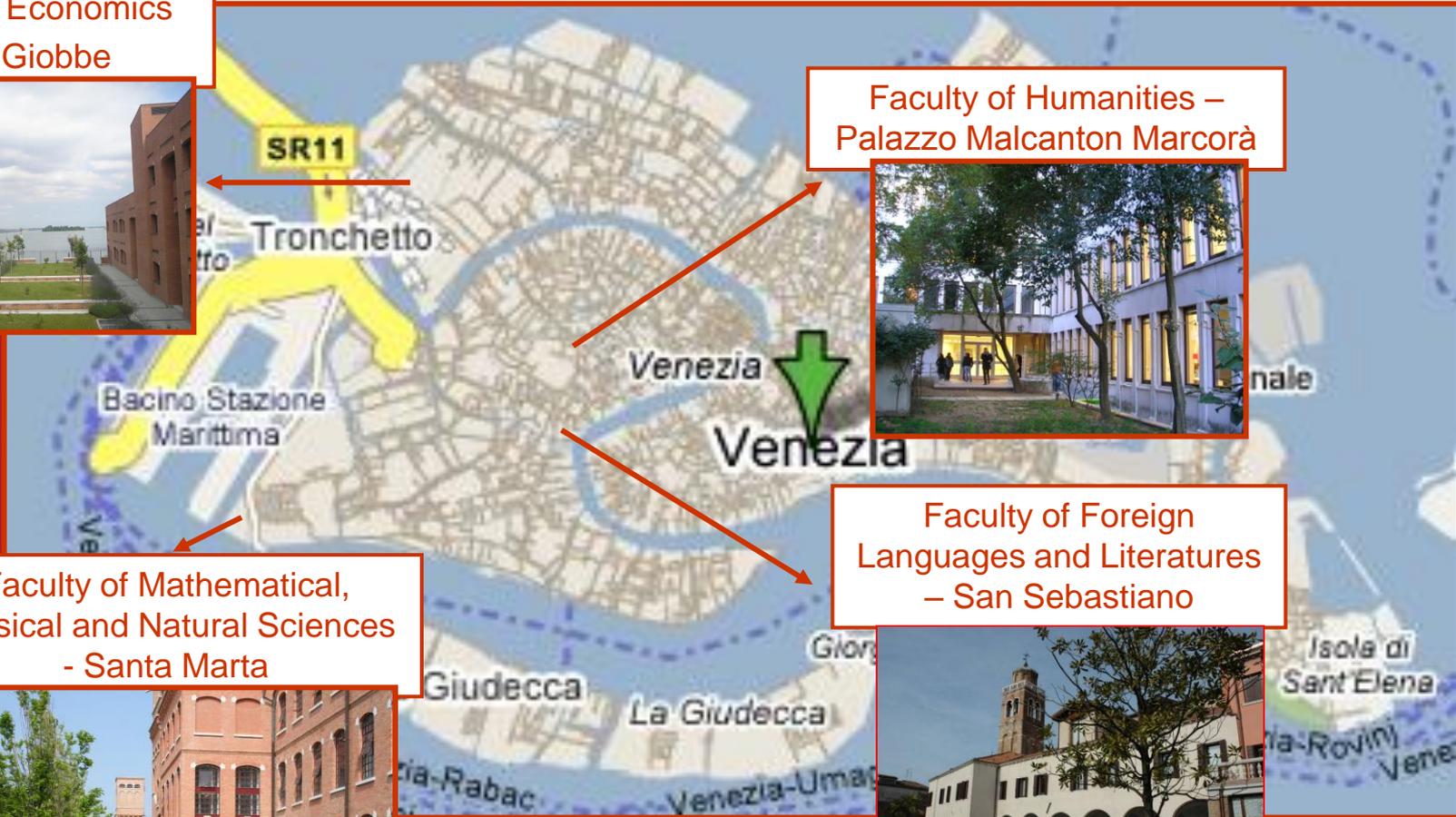
Faculty of Humanities –
Palazzo Malcanton Marcorà



Faculty of Mathematical,
Physical and Natural Sciences
- Santa Marta



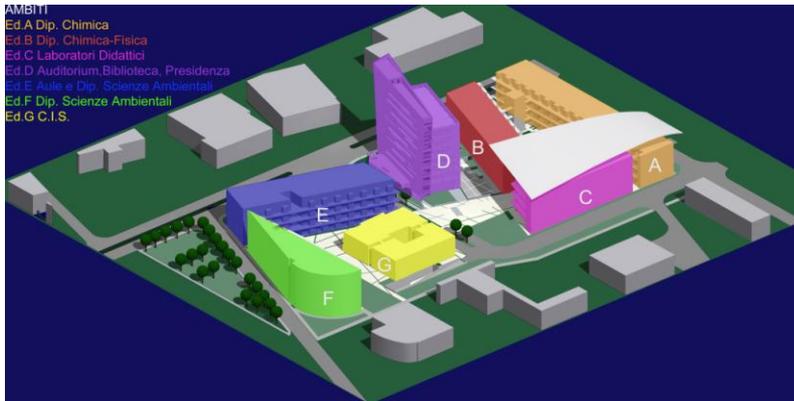
Faculty of Foreign
Languages and Literatures
– San Sebastiano





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Faculty of Mathematical, Physical and Natural Sciences



The origins of the Faculty of Mathematical Physical and Natural Sciences go back to the Faculty of Industrial Chemistry, which was founded in the Seventies.

Today the fields of study have expanded rapidly, resulting in three main areas: chemistry, with particular attention to new materials and green chemistry, environmental science and **computer science (since 1990)**.



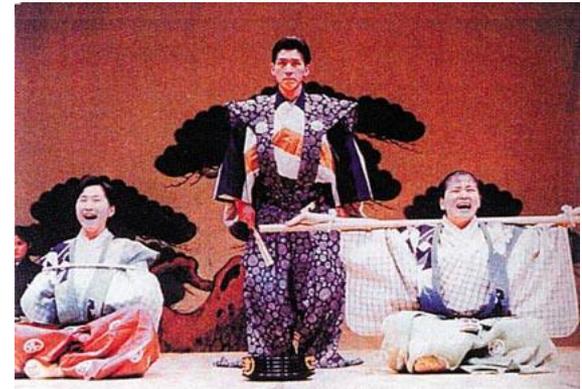
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Faculty of Foreign Languages and Literatures



The Faculty of Foreign Languages and Literatures is one of the oldest in Italy and it is also the only one to offer such a broad range of Western and Eastern languages, almost 40, all with their own syllabuses following different lines of study:

literary-philological, linguistic-foreign language teaching, cultural-historical, artistic, for tourism or archaeological-artistic and philosophical-religious.





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Faculty of Foreign Languages and Literatures

Languages of
Mediterranean and
Middle-to-Far East



Languages of Western
Countries

Languages of Far
East



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Faculty of Economics



The Faculty of Economics is one of the most prestigious in Italy, boasting a great tradition in the field of economics and business studies.

Today the Faculty teaches general economics (theory, methods and models, economic policies and applied economics), law, business administration and management, as well as mathematics and statistics. Particular areas and problems are studied such as tourism, foreign trade, the **application of computer science and statistics to business management**.





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Faculty of Letters



The traditional range of studies in the Faculty includes the degree courses in Literature, History and Philosophy with the addition, in the last few years, of other courses of a social and artistic nature as well as in the conservation of architectural and cultural heritage.



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University Libraries



The university library system has recently been restructured.

There are 4 libraries for the following fields:

Economics, Science, Languages and Humanities

the Economics Library – BEC – www.unive.it/bec

the Scientific Library – BAS - www.unive.it/bas

the Language Library BALI – www.unive.it/bali

the Humanities library BAUM, www.unive.it/baum and a new Library of Teaching Services in Venice (Zattere) – www.unive.it/bsd with around 75,000 volumes and covering 2,200 m² and 310 desks.

Departmental libraries are also available as well as an interlibrary loan service, with both national and foreign libraries.

www.biblio.unive.it



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Site for Workshops and Conferences



Ca' Dolfin, "Aula Magna" of Ca' Foscari



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Research at Ca' Foscari



Over the last few years Ca' Foscari University has reorganized its research policy and management.

In addition to the 19 departments, the traditional place of research with around 600 researchers, it has also created several **interdisciplinary centers of high academic quality and international renown, carrying out research in innovative fields**. These include CORILA (studies on the lagoon system), IDEAS (sustainable development), CIVEN (nanotechnologies), ECLT (complex systems and living technologies), INCA (green chemistry), Ciset (tourism), CVR (services for the territory). Ca' Foscari is also on the founder of **Nesting, a very recent consortium for R&D and technological transfer of ICT**.

In order to increase its own ability to raise funds and manage new projects, in particular funds from the European Commission, the University founded a **Research Service** which is active in the Research Division, and carries out fund raising activities which have increased Ca' Foscari's annual resources for research by around 4 million euros in just a few years.



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University Departments



American, Hispanic and Slavonic Studies
Ancient and Near Eastern Studies
Applied Mathematics
Chemistry
Computer Science
East Asian Studies
Economic Sciences
Economics and Business Management
Environmental Sciences
Eurasian Studies
European and Post-Colonial Studies
Historical Studies
History of Art and Conservation of Artistic Heritage
Italian Studies and Romance Philology
Legal Sciences
Linguistics
Philosophy and Theory of Science
Physical Chemistry
Statistics



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Ca' Foscari today

Established

1868

Courses

More than 100 basic degree courses (BA), specialist degrees (MA), masters and further qualifications, research doctorates (PhD) and a regional school of specialisation for secondary school teachers

Community

Almost **18.000** students
1.200 teachers, including permanent and temporary staff

Library collection

4 libraries according to disciplinary fields, 1 with teaching services
12 department libraries
More than 830.000 volumes
Over 4.000 subscriptions to periodicals

Motto

Venetiarum universitas
in domo Foscari

Faculties

4 principal academic
units

Ca' Foscari University Rector

Prof. Carlo Carraro

Annual Tuition fee

Max 1.500,00 €

Ca' Foscari seal



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Ca' Foscari

"If you travel down the Grand Canal from the Rialto to San Marco you immediately see from afar the magnificent palace of Ca' Foscari. Set on the corner of the San Pantaleone Canal, at the bend in what Byron called the most beautiful street in the world, the Foscari Palace, the centrepiece in a long row of patrician dwellings, is as surprising for the majesty of its position as for its elegant architecture" [Federico Stefani, director of the Venice State Archives].



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Computer Science



We are in Mestre, on the main land, not in the lagoon ;-(



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Faculty

Faculty

Simonetta Balsamo

Agostino Cortesi

Riccardo Focardi

Renzo Orsini

Alessandra Raffaetà

Antonino Salibra

Andrea Torsello

Michele Bugliesi

Augusto Celentano

Flaminia Luccio

Marcello Pelillo

Alessandro Roncato

Flavio Sartoretto

Giorgio Busetto

Nicoletta Cocco

Salvatore Orlando

Fabio Pittarello

Sabina Rossi

Marta Simeoni

PhD Students and Post Docs

Andrea Albarelli

Bhattacharya Sukriti

Alberto Calzavara

Alberto Carraro

Matteo Centenaro

Matteo Zanioli

Andra Marin

Damiano Macedonio

Raju Halder

Samuel Rota Bulò

Gabriele Tolomei

Maurizio Marek

Antonio Candiello

Lucia Gallina



Main Research Areas

- ***Databases***
- ***Multimedia Information Systems***
- ***Knowledge Discovery and Data Mining***
- ***Parallel Computing***
- ***Human Computer Interaction***
- ***Computer Vision***
- ***Program Analysis and Verification***
- ***Security***
- ***Distributed Systems***
- ***Performance evaluation***
- ***Numerical Computations***



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Education

Computer Science



- Bachelor:
 - “Laurea in Informatica” (3 years, 180 ETCS)
- Master
 - “Laurea Magistrale in Informatica” (2 years, 120 ETCS)
- PhD
 - “Dottorato in Informatica” (3 years)



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Bachelor degree

	Suggested Curricula	
	Curr. A (credits)	Curr. B (credits)
I year		
Programming	15	15
Discrete mathematics	12	12
Computer architecture	12	12
Calculus	9	15
English	6	6
II year		
Data structures and algorithms	9	15
Operating systems	12	12
Database systems	12	12
OO Programming and UML	6	
Project management	6	
Probability and statistics		6



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Bachelor degree

	Curr. A (credits)	Curr. B (credits)
III year	A	B
Computer networks	9	9
Formal languages and Computability	9	9
Operations Research	6	6
Law for Computer science	6	6
Human-computer interaction	6	6
SW Engineering	6	
Web technologies and applications	6	
Stage	12	12
Final Dissertation/Exam	6	6
Elective courses	12	12

Elective Courses	
Business administration	6
System Administration Lab	6
Languages for network: XML	6
Web design	6
E-commerce	6
Information economy	6
Physics	6



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Master degree

I year		
	Curr. A (credits)	Curr. B (credits)
Mathematical Logic	6	6
Information theory	6	6
Compilers	6	6
Advanced database systems	9	9
Distributed systems	9	9
Artificial Intelligence	12	
Foundations of programming languages		12
II year		
Numerical Algorithms	6	6
Multimedia systems	12	
Data and web mining	6	
High performance computing	6	
Security		12
Computer System Performance and Reliability		6
Program Analysis		6
Stage	6	6
Final Dissertation	24	24
Free Credits	12	12



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Master degree

Elective Courses

	(credits)
Bioinformatics	6
Logic programming	6
Functional programming	6
Computer vision	6
Scientific computing and visualization	6
Coding theory	6



PhD Degree

- The admission is by **competitive examination**, which is announced each year by the University Ca' Foscari of Venezia generally in June/July and takes place in October/November.
- In the first year the graduate students are required to attend 6 courses and to pass the corresponding exams. Each **course consists of 20 lecture hours**. The courses are in **Italian** or in **English**.
- At the end of the three years, graduate students have to complete a **research thesis**, which must contain significant original results, published in Int.l Journals or Conferences.
- The language of the thesis must be **English**
- This research thesis is first reviewed by two **international experts**, while the actual defense will occur in front of a board of examiners composed of Italian and/or foreign experts.



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Research Areas in Physics of Materials



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1. Nanostructured (silicate) glasses

Giancarlo Battaglin

Elti Cattaruzza

Francesco Gonella

Enrico Trave

Main properties

- * optical confinement
- * optical nonlinearity
- * magnetic

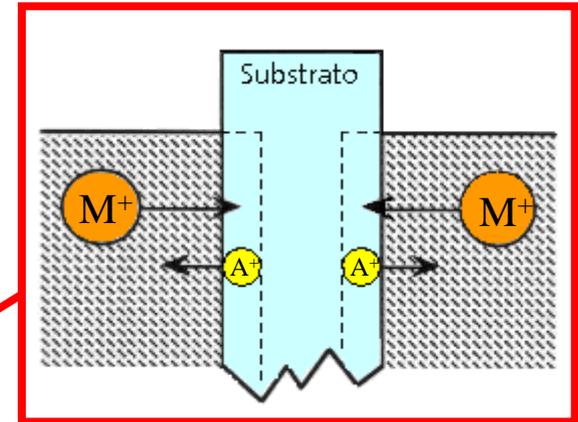
Applications

- * photonics and integrated optics
- * optoelectronics
- * magnetic recording
- * catalysis
- * sensoristics

Research lines

Glassy composite films

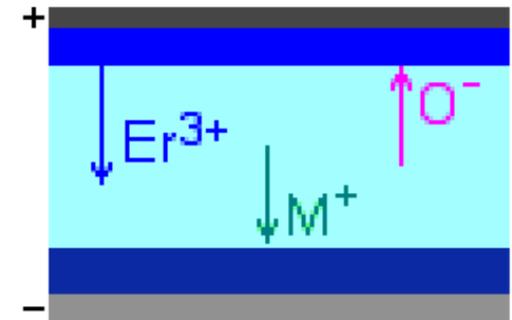
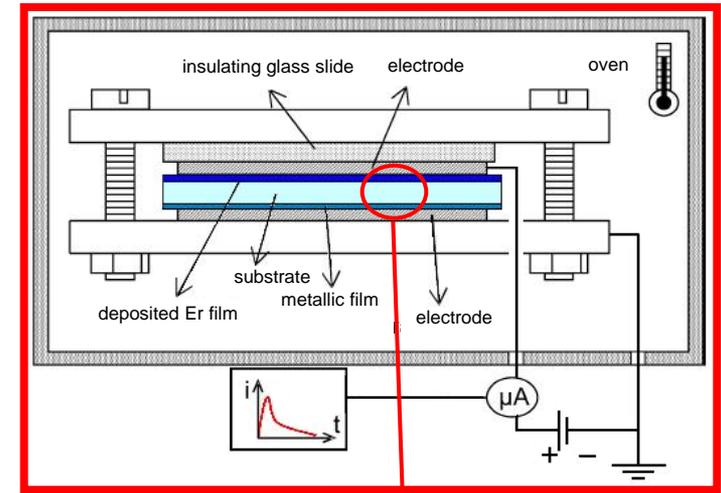
- * waveguides (linear optics)
- * nonlinear optical materials
- * active optical materials
- * magnetic materials
- * (conventional) ion exchange



Research lines

Glassy composite films

- * waveguides (linear optics)
- * nonlinear optical materials
- * active optical materials
- * magnetic materials
- * (conventional) ion exchange
- * field-assisted solid-state ion exchange





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Research lines

Glassy composite films

- * waveguides (linear optics)
 - * nonlinear optical materials
 - * active optical materials
 - * magnetic materials
-
- * (conventional) ion exchange
 - * field-assisted solid-state ion exchange
 - * deposition by a "radiofrequency magnetron sputtering"



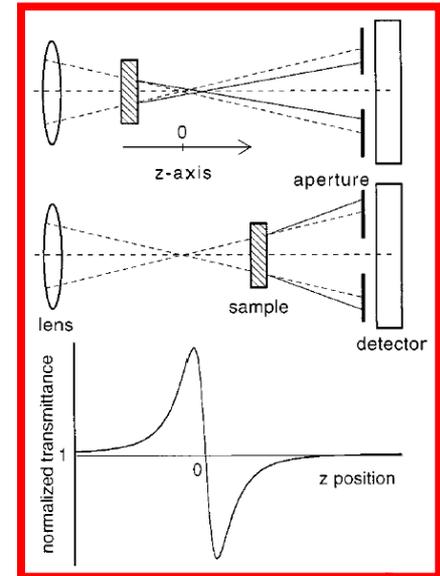
Research lines

Glassy composite films

- * waveguides (linear optics)
 - * nonlinear optical materials
 - * active optical materials
 - * magnetic materials
- * (conventional) ion exchange
 - * field-assisted solid-state ion exchange
 - * deposition by a "radiofrequency magnetron sputtering"

Optical properties study

- * nonlinear refractive index ($n = n_0 + n_2 I$)
- * by means of a single-beam technique called "Z-scan"



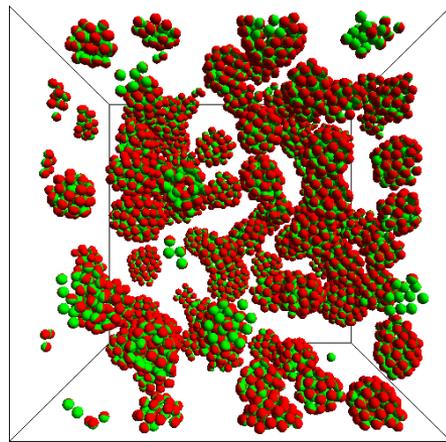
2. Soft Matter theoretical group

Achille Giacometti
Faculty

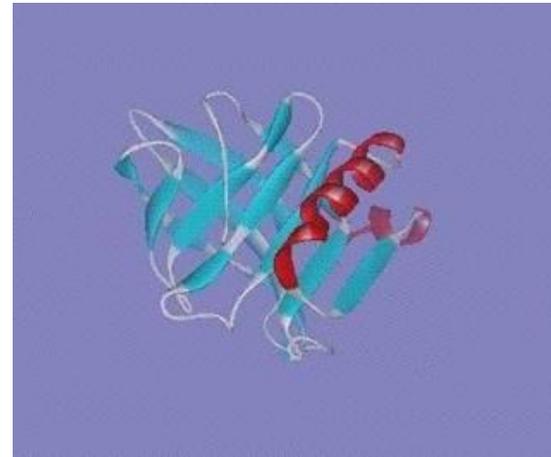
Domenico Gazzillo
Faculty

Artem Badasyan
Post-doc

Self-assembly processes

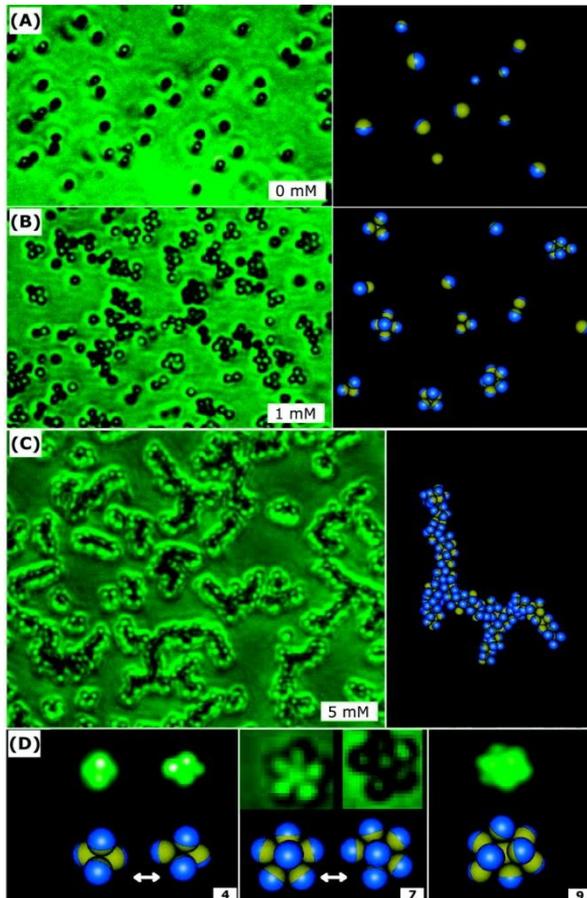


Protein folding



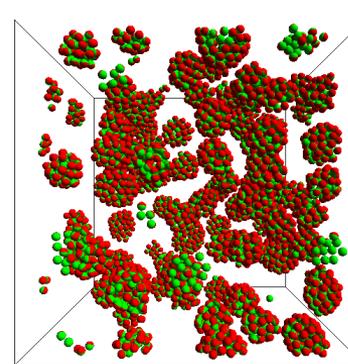
Self-Assembly of patchy colloids

Experimental motivations

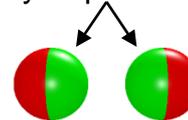


Hong, Cacciuto, Luijten, Granick,
Langmuir 24, 621 (2008)

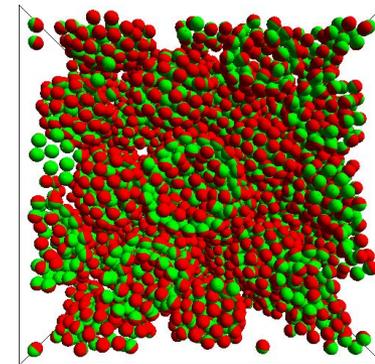
Numerical simulations and theoretical analysis



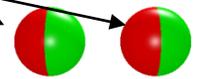
hydrophobic



Head-to-Head

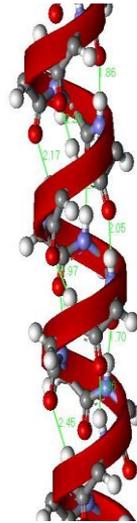


hydrophilic



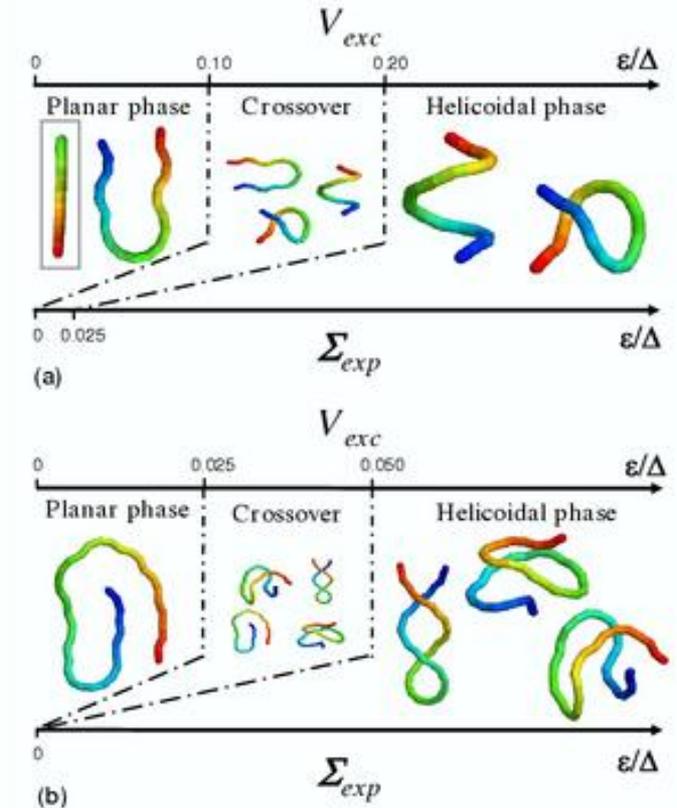
Head-to-Tail

Protein folding



Formation of secondary
structure in proteins?
Helix formation?

C. Poletto, A. Giacometti, A. Maritan,
A. Trovato, J.R. Banavar,
Phys. Rev. E 77, 061804 (2008)



Optimal packing induced
by the solvent-chain interactions



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3. High aspect ratio nanomaterials for sensors

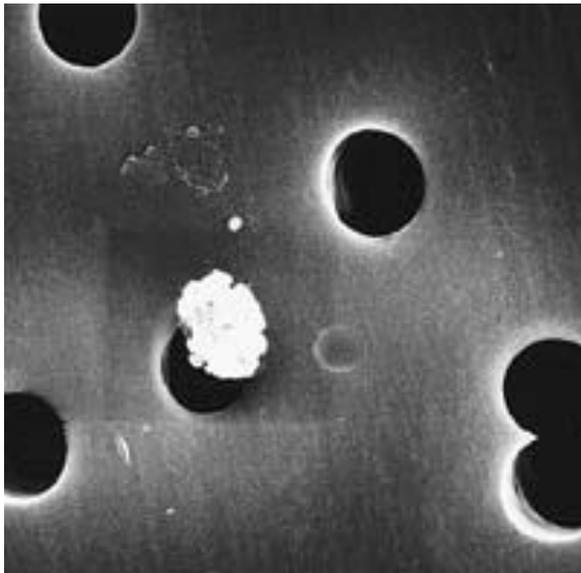
Paolo UGO, L.M. Moretto

Laboratory of Sensors for Electroanalysis (LSE)

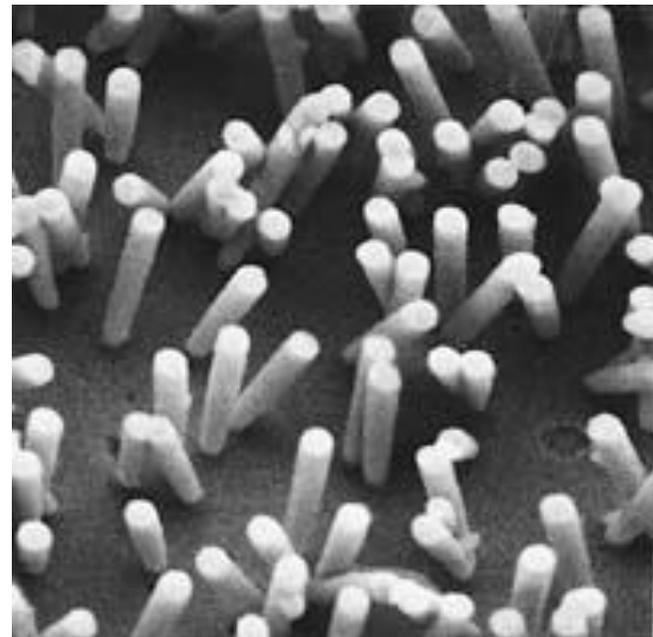


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Template synthesis in nanoporous membranes



**SEM image of
template membrane**

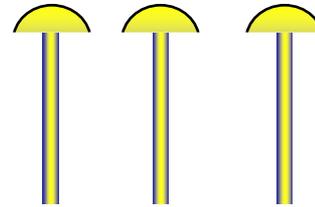
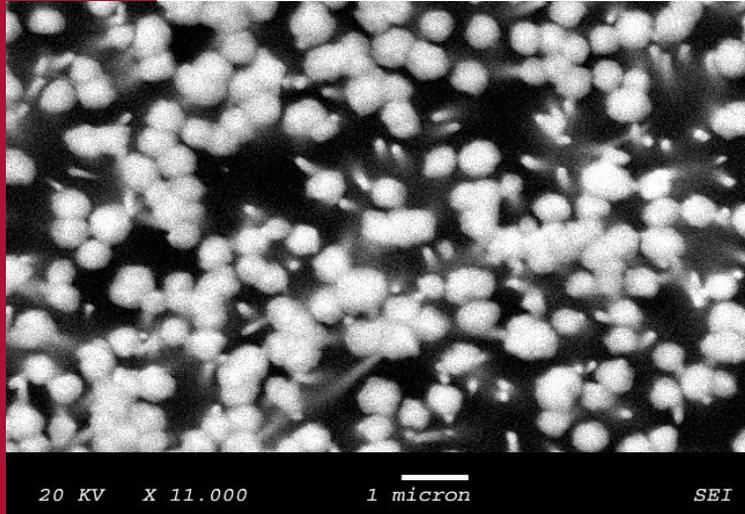


**Structure generated
in the template**



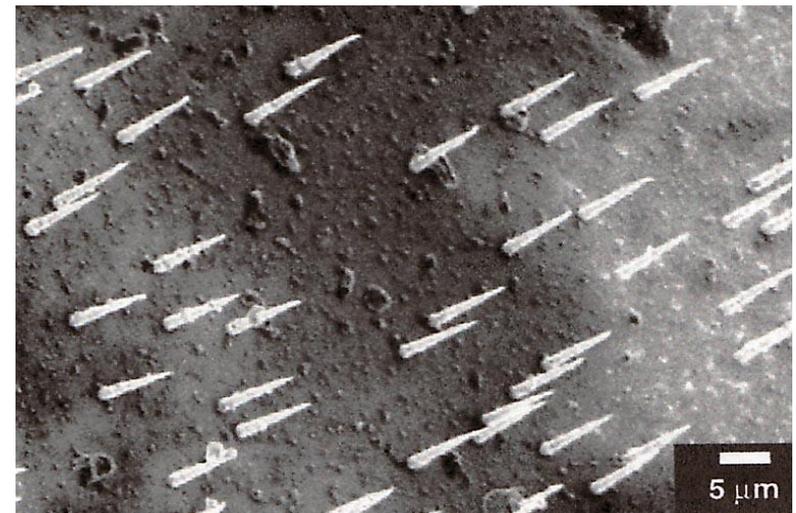
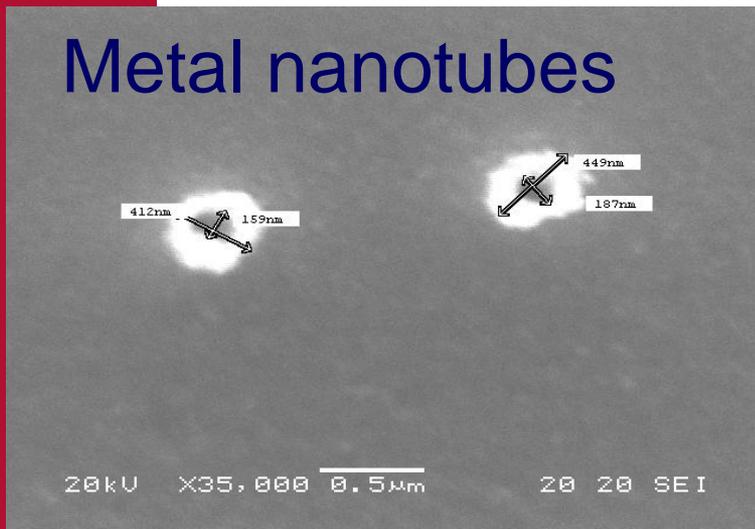
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Different nanomaterials with different shapes



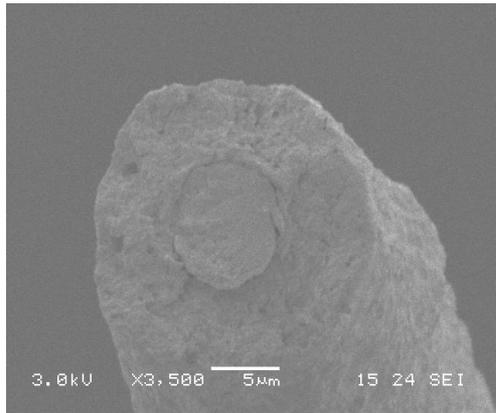
Metal
mushrooms

Nanocones

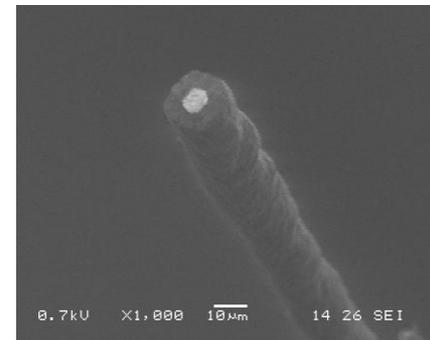


4. Preparation of micro and nano-sensors and micro and nano-electrodes for electroanalysis

S.Daniele
A.Baldo
C.Bragato

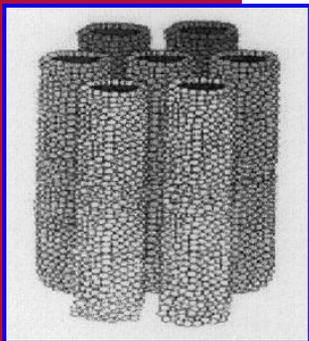


**Carbon fiber 7 µm
coating 8 µm**

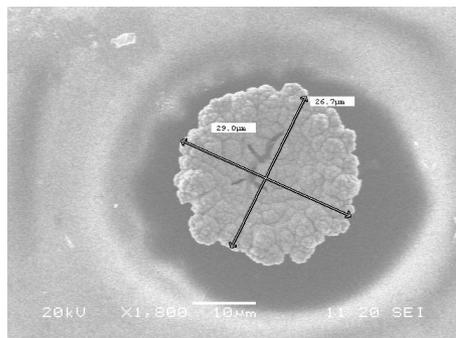


**Pt wire 12.5 µm radius
coating 8 µm**

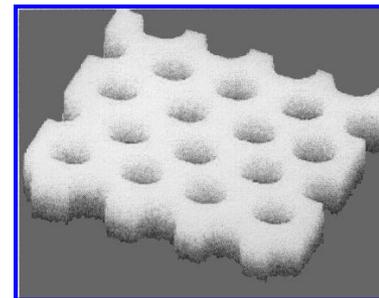
Modified electrodes with a mesoporous film of Pt



Preparation
Nonionic surfactant:
octaethyleneglycol monohexadecyl
ether (C₁₆EO₈) 42%
-H₂O 29%
- Hexachloroplatinic acid (HCPA) 29%

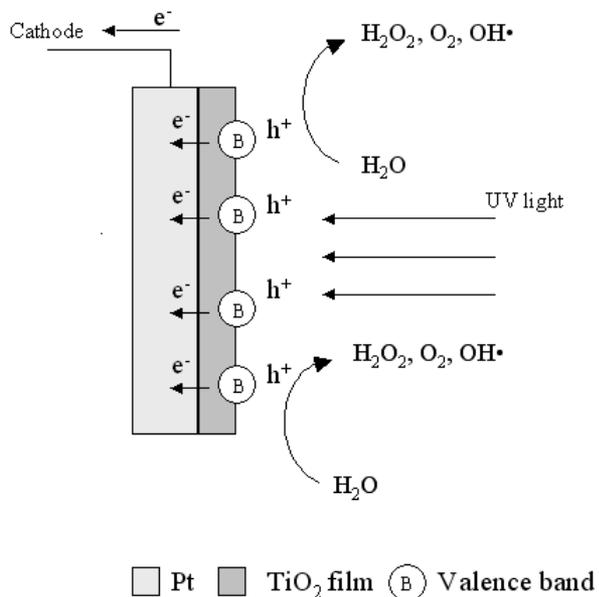


Modified micro and nano electrodes

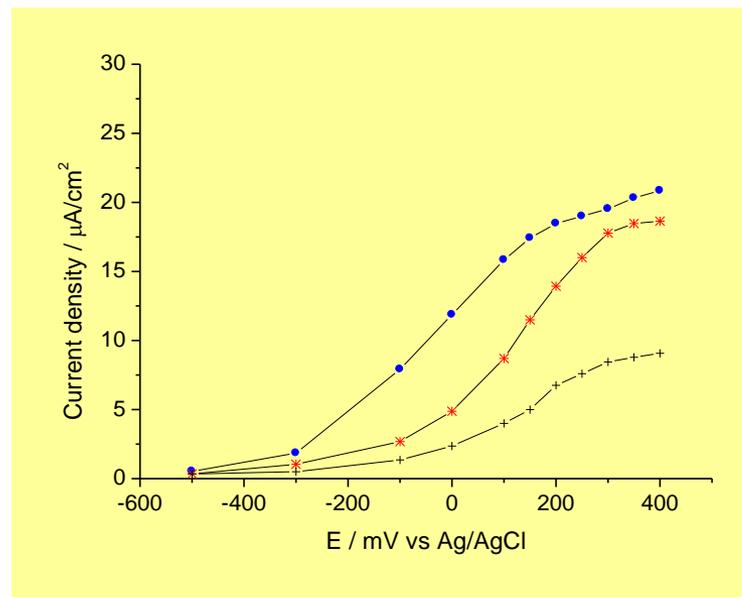


Cylindrical
Pore
($\phi = 2-3$ nm)

Voltametric study of the photocatalytic properties of Pt/TiO₂ nanocomposites



Scheme of the photoinduced processes at the Pt/TiO₂ and TiO₂/solution interface



Dependence of the photogenerated current as a function of applied potential and TiO₂ layer thickness: (●) 100 nm; (*) 50 nm; (x) 20 nm, on 100-nm Pt films.

Scanning electrochemical Microscopy

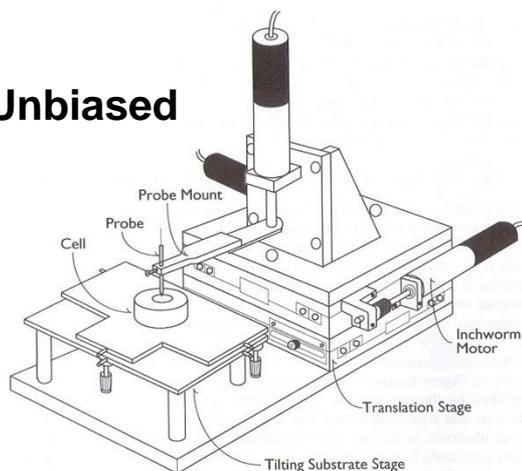
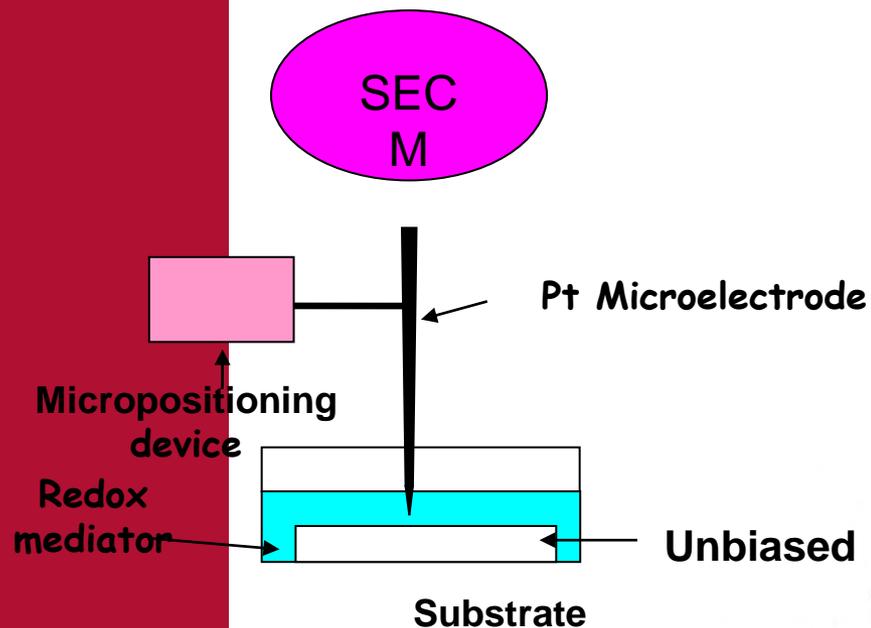
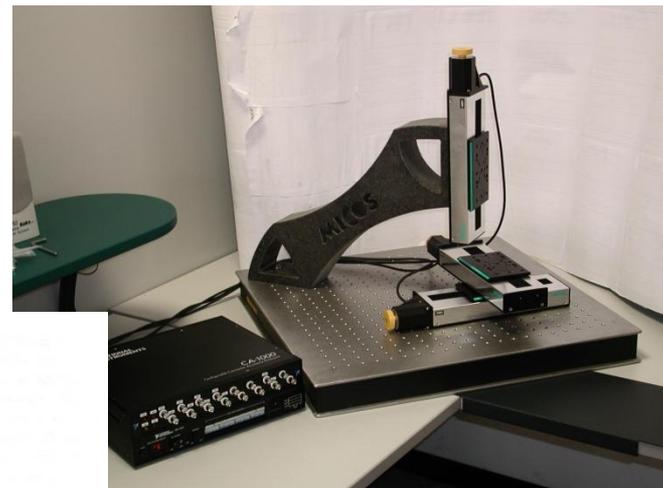
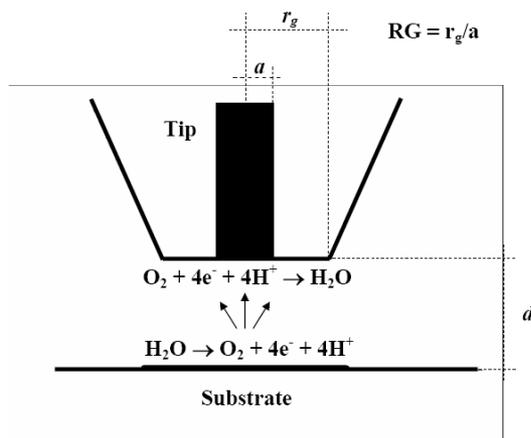


FIG. 5 An illustration showing translators and tip and cell mounts for the commercially available CH model 900 SECM.



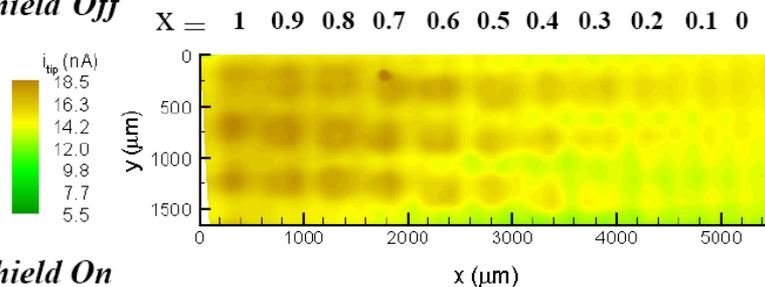


application: Fuel Cells

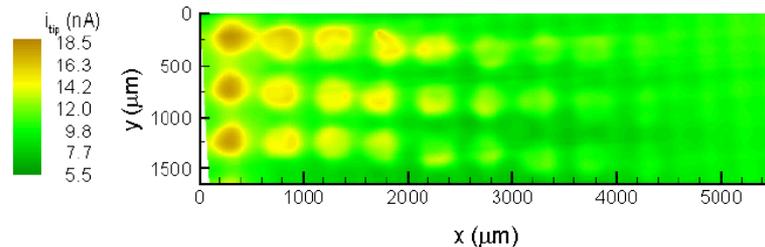
Fast SECM screening of the anodic materials activity for the electro-oxidation of H_2O to O_2

$Sn_{1-x}Ir_xO_2$ mixtures nominal composition

A) *Shield Off*



B) *Shield On*





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5. Luminescence nanocomposites containing lanthanide ions

A.Benedetti
P.Canton
D.Cristofori
I.Freris
S.Polizzi
P.Riello

Lanthanide ions: Er^{3+} , Yb^{3+} , Eu^{3+} , Tb^{3+}

Matrix: SiO_2 , ZrO_2 , PMMA



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2 Bragg-Brentano diffractometers and 2 Kratky Cameras



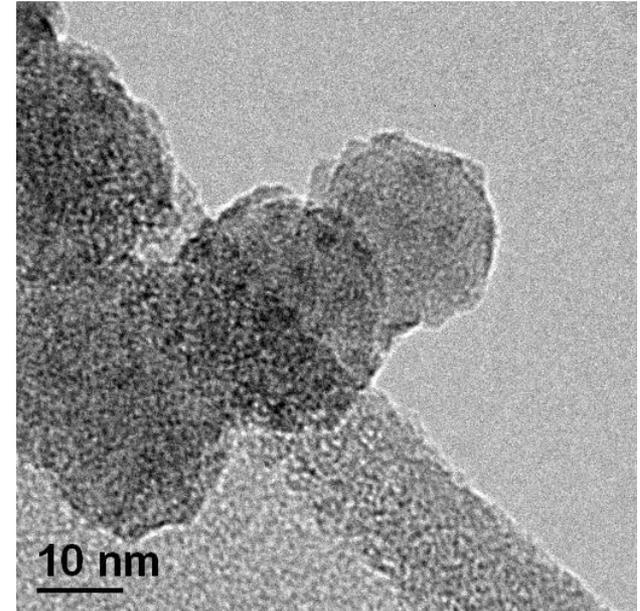
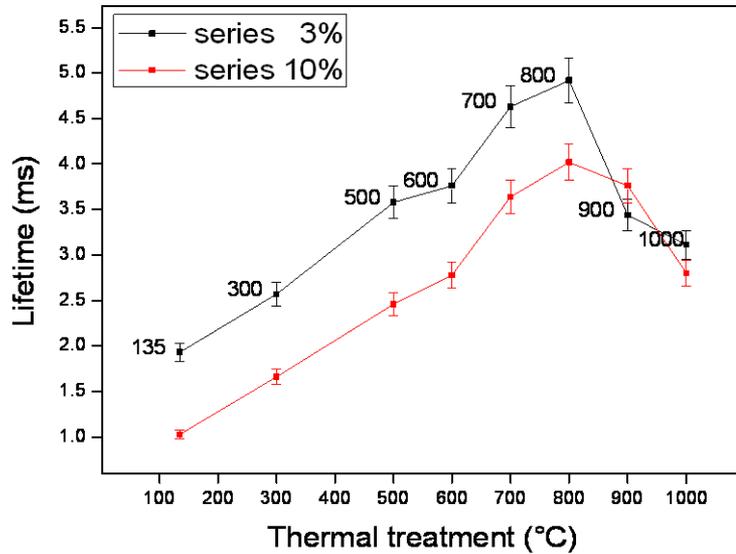
A XRD camera at Elettra
for "in situ" measurements
at different
temperatures and
controlled atmosphere



TEM
Jeol 3010

SEM
Jeol 5600LV



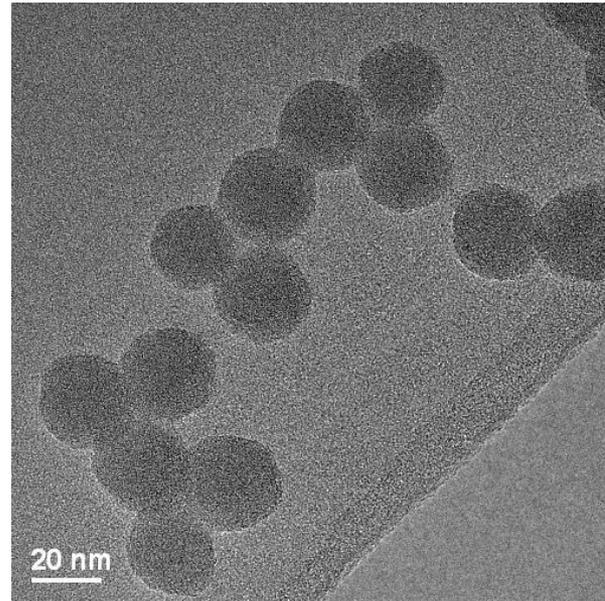


**Eu³⁺:ZrO₂ nanocrystals
embedded in amorphous SiO₂**

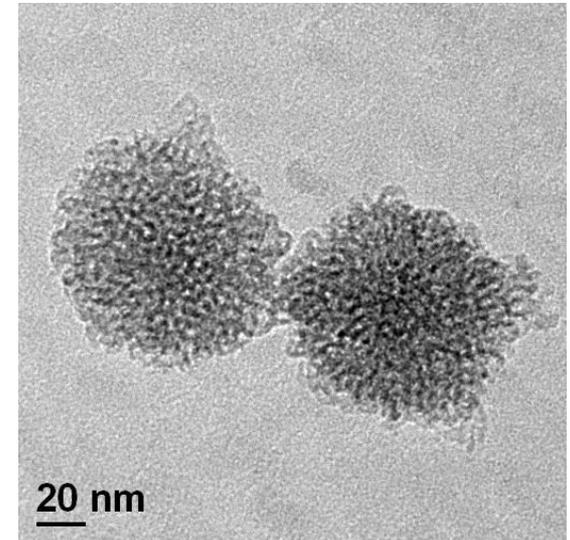
**Silica-supported Eu³⁺-doped
zirconium carbonate**

Synthesis of silica

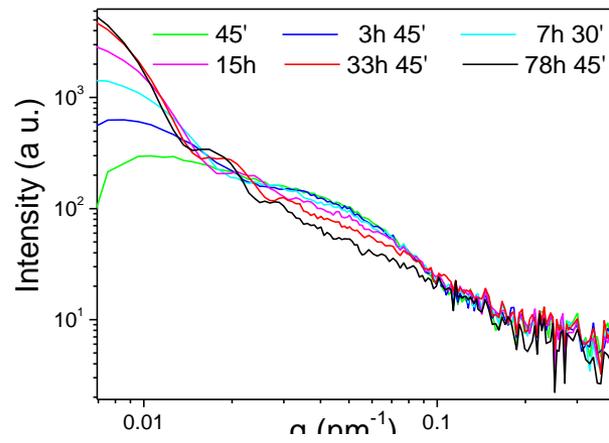
Stober



Mesoporous silica

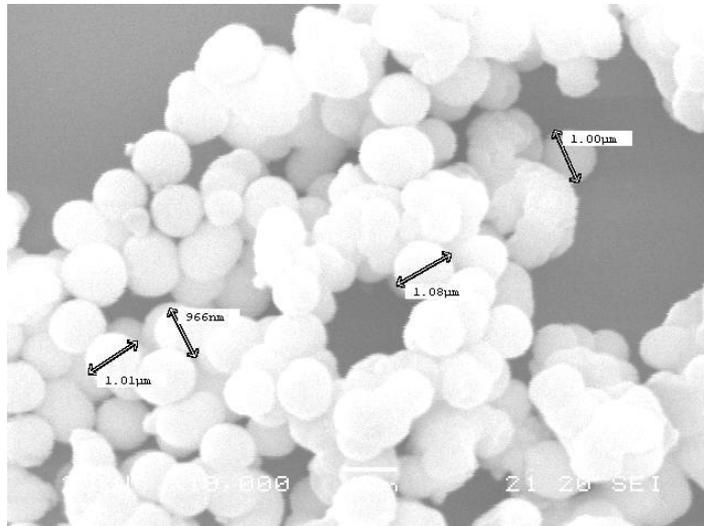


microemulsion

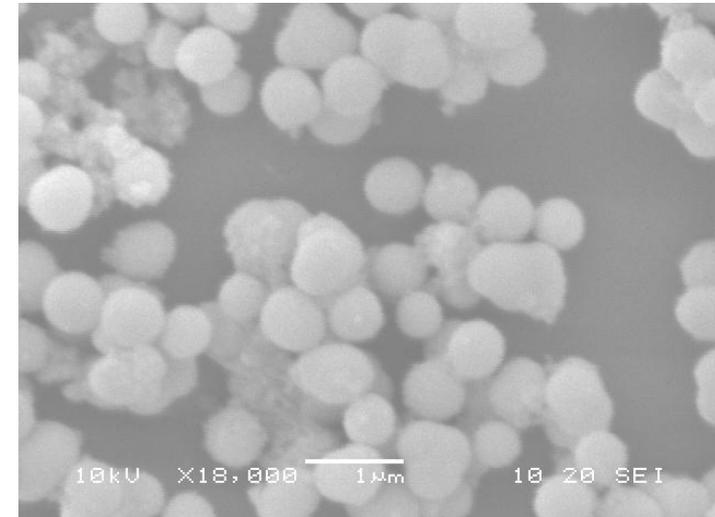


Synthesis of zirconia particles

In the presence of sodium chloride



In the presence of cesium chloride



Encapsulation of
silica particles
by a thin shell of
PMMA

