

Max Planck CNRS Center on Nanomaterials

21 November 2011

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Basic research is the foundation for overall technological advancement in the wider sense

- 81 Max Planck Institutes and Research Units headed by 273 Scientific Directors
- 16,873 staff members (Jan 1st, 2011)
- Plus 7,025 grantees and visiting scientists (Jan 1st, 2011)
- Annual budget 1.4 billion € (2011) plus 300 million € third party funds

Instruments of the International Presence and Cooperation



1

International Cooperation

of the Max Planck Institutes

2

Institutional Cooperation

abroad

3

Institutional Presence

abroad

- 5.905 global research partners
 - 4,987 international projects
 - 3.117 projects in countries of the EU
 - 120 countries
-
- 62 International Max Planck Research Schools (IMPRS)
 - 38 with international partners
 - 2.700 PhD students, of which 52% are of foreign nationality from 100 countries

Strategic Instruments of the International Presence and Cooperation



1 International Cooperation of Max Planck Institutes

2 Institutional Cooperation abroad

3 Institutional Presence abroad

- International Max Planck Centers
- Max Planck Partner Institutes (Shanghai, Buenos Aires)
- Max Planck Research Groups
 - Poland (mutual), China
- Structured cooperation activities of Max Planck Institutes
 - MPG-CNRS Associated Research Labs (LEAs) and GDREs
- Partner Groups:
 - 46 worldwide (11/11)

1

**International
Cooperation**
of Max Planck Institutes

2

**Institutional
Cooperation**
abroad

3

**Institutional
Presence**
abroad

- Max Planck Institute abroad
 - „classial" MPI: Rome, Florence, Nijmegen
 - Member Institute: **Florida, *Luxemburg***



- Research facilities (e.g. astronomy)

Max Planck Centers



- Max Planck Center (*incl. those in planning*)
- Max Planck Partner Institute



■ **India**

- Indo Max Planck Center for [Computer Science](#), IIT Delhi
- Max Planck NCBS Center for [Lipid Research](#), Bangalore



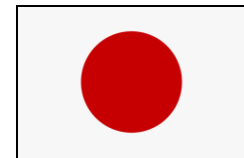
■ **Canada**

- Max Planck – UBC Center for [Quantum Material](#), Vancouver



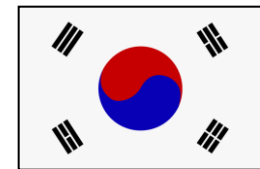
■ **Japan**

- Max Planck – RIKEN Center for [Systems Chemical Biology](#), Wako



■ **Korea**

- Max Planck Asia Centre for [Attosecond Science](#), Pohang



Approved Max Planck Centers in the planning phase



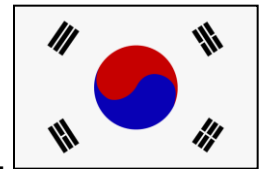
■ USA

- Max Planck – Princeton Center for Plasma Physics



■ Korea

- Max Planck –POSTECH Center for Complex Phase Materials, Pohang



■ Israel:

- Max Planck – Weizmann Center for Anthropology/Archaeology
- Max Planck – HUJI Center for Neurobiology



■ France

- Max-Planck-Sciences Po Center, Paris



■ Spain

- CSIC-MPG Research Unit "Convivencia", Madrid



MP Centers: New structural element in the international strategy of the MPS



Through the establishment of Max Planck Centers, the Max Planck Society creates

Network structures based on excellence

Platforms for pooling expertise

The use of diverse and field-tested cooperation measures

Scientific added-value



Objectives

Platforms for the creation of scientific added value

- Strengthening of international scientific cooperation of Max Planck

Institutes with international Partners

- Enhancing the scientific performance of all institutions involved
- Mutual access to leading research infrastructures
- Offering new career options for young researchers
- International visibility



Key Features: Platform for the creation of scientific added value

- Exchange of researchers
- Workshops, Summer and Winter Schools etc.
- Joint Ph.D.-Programs (IMPRS)
- Offering opportunities for research work at the respective partner laboratory
- ...

Characteristics and Framework

- Basis: Excellent research program involving MPIs (>1) and a high-ranking international research institution/University
- No legal entity; bilateral equivalent funding
- Limited lifetime (5 years + 1 extension possible)
- Quality assurance through specific selection procedure and Scientific Advisory Committee



Max-Planck-Institute for Polymer Research Mainz

Fundamental research in soft matter science,
in particular macromolecular materials

K. Landfester	Phys. Chemistry
H. Spiess	Spectroscopy
K. Müllen	Synthesis
M. Bonn	Material sci.
K. Kremer	Theory
H.-J. Butt	Polymer physics



Aims of the Center for Nanomaterials



MPIP and ICS are well recognized centres in Polymer Science, IPCMS has a strong recognition in the chemistry and physics of Nanomaterials (single molecule to hybrid materials).

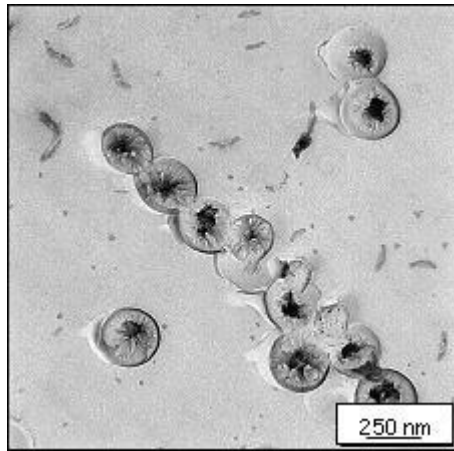
The project aims at going much further by pushing to their limits key area in nanosciences, such as the design and understanding of smart nanomaterials, soft and hybrid materials in domains such as environment, energy, information technology or health, owing to their strategic importance in societal concerns.

We propose to launch a close French-German cooperation with a visionary project on Nanomaterials.

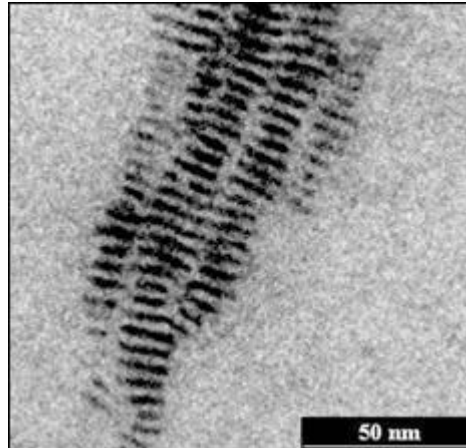
Encapsulation of materials in nanoparticles



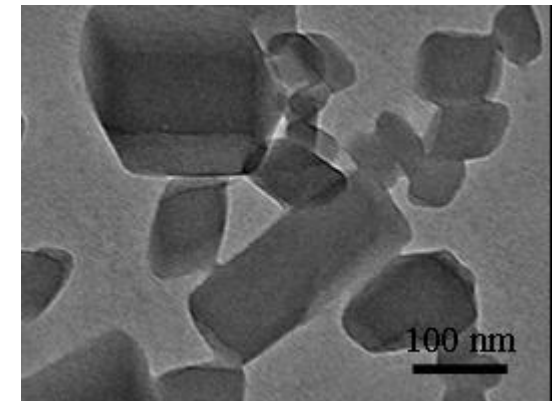
CaCO_3 in polystyrene



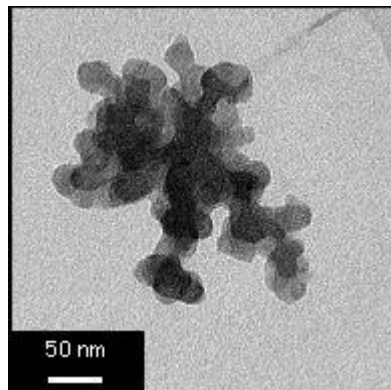
Lanthanide complexes
in polyacrylate



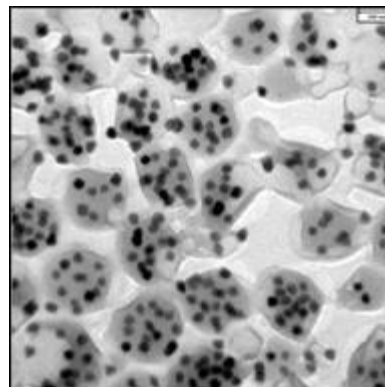
Pigments in polystyrene



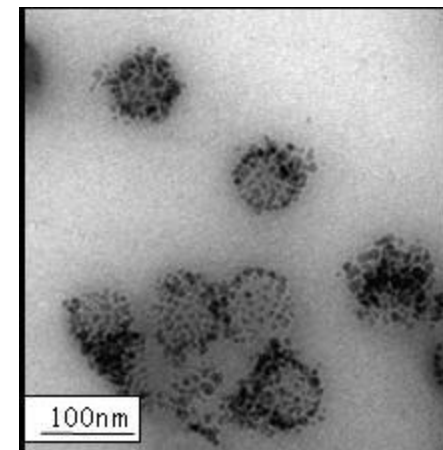
Carbon black in polystyrene



Fe_3O_4 in polylactide



Fe_3O_4 in polystyrene

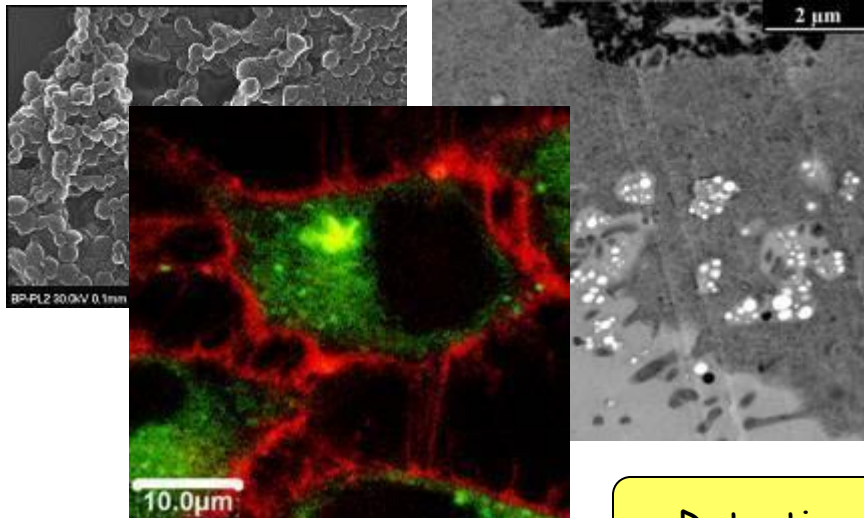


Polymeric nanoparticle in biomedical applications

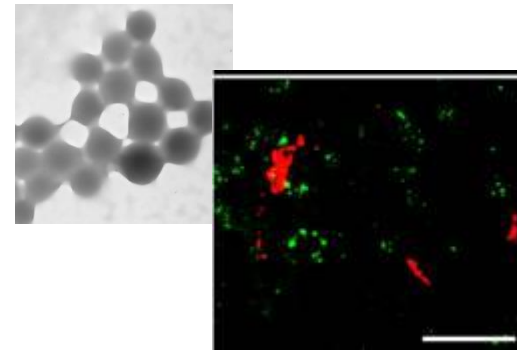


Cell labelling and delivery of biomedical components

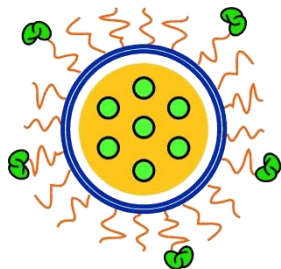
Uptake in cells



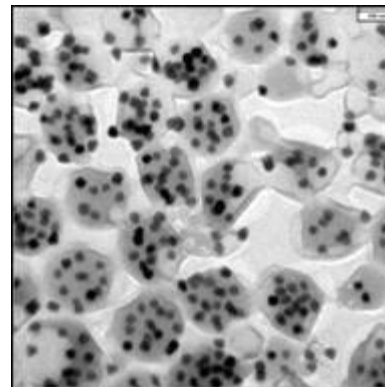
Influence of proteins



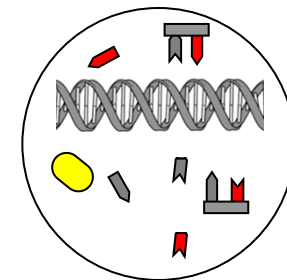
Targeting of cells



Detection of particles



Biomolecules in nanodroplets



Single chain polymer chemistry - Conformation in confinement

ay amino acids, peptides, antibodies...

