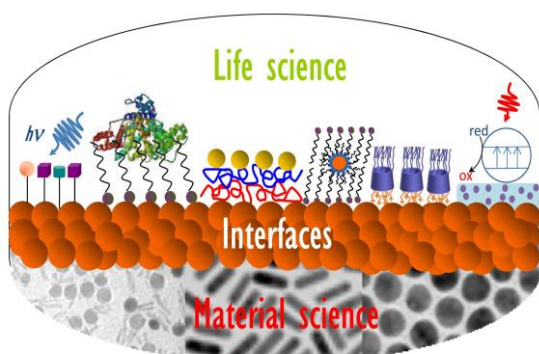
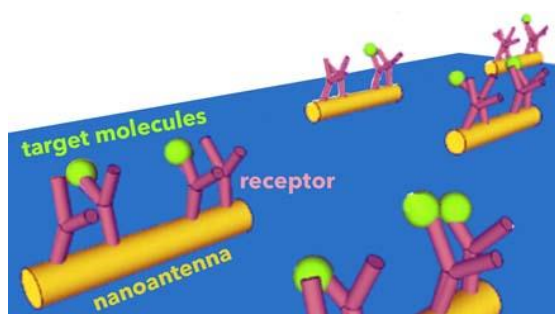


At IPCF, the research activity is intrinsically inter-disciplinary and focused on Chemical and Physical topics, as soft matter, disordered systems, interfaces, composites and nano-structured materials, supra-molecular architecture and biophysics, complex fluids and colloids. Main interests concern with the investigation of phenomena as self-organization, surface interactions, relaxation and transport properties, from nano- to meso-scale. IPCF is involved in the design and manufacturing of tailored materials, on theoretical models, on computational and analytical techniques and in the development of new devices and experimental methodologies. Some of the activities are highly relevant for the society (energy, environment, health): development of dye sensitized solar cells, pollutant sensors and techniques for environmental clean-up, development of technologies for industry and nanomedicine. The Institute is active, also as the coordinator, in many National and International (including EU) projects. IPCF is involved in the design and construction of beam lines at neutron Large Scale facilities, including the European Spallation Source and the STFC Rutherford Appleton Laboratory. At IPCF we are also deeply involved in the technological transfer of the obtained results



Three different strongly connected *soft matter* research areas are covered, as

- i) *Life Science* for isolation, reconstitution and investigation of biomaterials for energy transduction and molecular recognition;
- ii) *Material science* for synthesis of nanostructured materials and their mesoscale organizations for optoelectronic, biomedical and environmental applications
- iii) *Interfaces and hybrid systems* of photochemical interest, towards new generations of complex materials



Optical nanoantennas can be functionalized with bioreceptors to selectively detect target molecules (biomarkers, food pathogens, pollutants) using high sensitivity spectroscopies, as Surface Enhanced Raman Scattering (SERS).



Preparation of biodegradable and compostable polymer matrix composite materials using natural fibers derived from waste materials of, food industry and agriculture. The research combines skills in macromolecular chemistry and materials science related to the functionalization of surfaces, interfaces compatibilization, plasticization of polymer matrices and for the understanding of the effects of interfaces and confinement on the final properties of the materials at nanoscale level.

Our Successes:

Coordination FP7 EU project

European Project "Nanocomposite Materials for Photocatalytic Degradation of Pollutants" LIMPID (G.A. 310177) SEVENTH FRAMEWORK PROGRAMME T HEME 4, Small or medium-scale focused research project, NMP.2012.2.2-6 Photocatalytic materials for depollution. (M.L. Curri)

National Competition

Start-cup 2012 CNR-Sole24ore Award for the "Best communication" (G. Salvetti, A. Boggioni, M. Angiuli)

Award Orione 2014 to **Giuseppe Calogero** for "his competence and commitment of Researcher " .

International Competition

International Journal of Molecular Science Best Paper Award 2014. 3rd prize: **Giuseppe Calogero, Gaetano Di Marco**, Silvia Cazzanti, Stefano Caramori, Roberto Argazzi, Aldo Di Carlo and Carlo Alberto Bignozzi. "Efficient Dye-Sensitized Solar Cells Using Red Turnip and Purple Wild Sicilian Prickly Pear Fruits" (ref *Int. J. Mol. Sci.* **2014**, *15*, 1683-1685; doi:10.3390/ijms15011683)

Publications with high Impact Factor

Marago Onofrio M.; Jones Philip H.; **Gucciardi Pietro G.**; Volpe Giovanni; Ferrari Andrea C., *Optical trapping and manipulation of nanostructures*. NATURE NANOTECHNOLOGY **8** (11) 807-819 (2013). DOI: 10.1038/NNANO.2013.208 **IF 33,26**

A. Loiudice, A. Rizzo, G. Grancini, M. Biasiucci, M. R. Belviso, **M. Corricelli, M. L. Curri, M. Striccoli, A. Agostiano**, P. D. Cozzoli, A. M. Petrozza, G. Lanzani, G. Gigli *Flexible all-inorganic nanocrystal solar cell by room-temperature processing*. Energy & Environmental Science, **6**, 1565-1572 (2013) DOI: 10.1039/C3EE23928D **IF 15.49**

Milano Francesco; Tangorra, Rocco Roberto; Omar Omar Hassan; Ragni Roberta; Operamolla Alessandra; **Agostiano Angela**; Farinola Gianluca M.; **Trotta Massimo**, *Enhancing the Light Harvesting Capability of a Photosynthetic Reaction Center by a Tailored Molecular Fluorophore*. ANGEWANDTE CHEMIE-INTERNATIONAL EDITION **51** (44) 11019-11023 (2012). DOI: 10.1002/anie.201203404 **IF 11,34**

Micali N.; Engelkamp H.; van Rhee P. G.; Christianen P. C. M.; Sclaro L. Monsu; Maan J. C., *Selection of supramolecular chirality by application of rotational and magnetic forces*. NATURE CHEMISTRY **4** (3) 201-207 (2012). DOI: 10.1038/NCHEM.1264 **IF 23,30**

Barcaro Giovanni; **Sementa Luca**; **Negreiros Fabio R.**; Ferrando Riccardo; Fortunelli Alessandro, *Interface Effects on the Magnetism of CoPt-Supported Nanostructures*. NANO LETTERS **11** (12) 5542-5547 (2011) DOI: 10.1021/nl203449y **IF 12,94**

Irrera Alessia; Artoni Pietro; Saija Rosalba; **Gucciardi Pietro G.**; **Iati, Maria Antonia**; Borghese Ferdinando; Denti Paolo; Iacona Fabio; Priolo Francesco; **Marago Onofrio M.**, *Size-Scaling in Optical Trapping of Silicon Nanowires*. NANO LETTERS **11** (11) 4879-4884 (2011) DOI: 10.1021/nl202733j **IF 12,94**

Large scale facilities

Responsibility for INES (the Italian Neutron Station) at ISIS (UK).

Development of the imaging system of the IMAT (Imaging and MATerials) beam line at ISIS. (UK).

728 peer reviewed publications 2010-2014

9.5 M€ funding 2010-2014



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