

PERSONAL INFORMATION

Orsi, Davide



 via Borsellino 7, 43012 Fontanellato, PR, Italy

 +39 0521 905240

 davide.orsi@unipr.it

Date of birth 03/04/1984 | **Nationality** Italian

RESEARCH ACTIVITY

Research Activity

Current Position
1st May 2012 – 30th April 2018
15th May - 15th September 2018

Ricercatore a Tempo Determinato, Ex. Art. 24, lettera A, L.240/2010

Assegno di ricerca, Ex. Art. 22, L.240/2010

Borsa di ricerca, Art. 18, comma 5, L.240/2010

Department of Mathematical, Physical and Computer Sciences, University of Parma

Summary

My research activity is focused on: - Synthesis and characterization of nanostructures for Nanomedicine;

- Interfacial dynamics and rheology of interfacial layers;
- Interfacial dynamics and rheology of emulsions and foams.

Nanostructures for deep cancer therapy I developed and characterized nanostructures for Self-Lighted Photodynamic Therapy (SLPDT) of deep tumors, initially within a collaboration between the University of Parma and IMEM-CNR started by dr. G.Salviati (IMEM-CNR, Parma). SLPDT is a proposed approach to the treatment of deep tumors built on the principles of photodynamic therapy (PDT). Usual PDT uses UV-visible light sources to excite molecules that produce reactive oxygen species (ROS), such as singlet oxygen ($^1\text{O}_2$), that kill cancer cells. The low penetration depth of the light stimulus limits PDT applicability to melanoma and other superficial tumors. Instead, SLPDT uses highly penetrating radiation from a Radiotherapy clinical source to excite a ROS-generating nanostructure. Hence, SLPDT promises to combine the positive effects of Radiotherapy and PDT, reducing radiation doses and adverse side effects. I developed an inorganic nanostructure for SLPDT made of CeF_3 nanoparticles embedded in a nano-sized ZnO matrix. CeF_3 is an efficient scintillator; its UV emission under X-ray irradiation photo-activates ZnO in cascade to produce ROS. We demonstrated that this nanostructures are effective SLPDT agents at very low radiation doses, causing a reduction of viable cancer cells of 50% with respect to Radiotherapy alone.

This research resulted in these publications:

- Nanomedicine, 13 18 (2018)
- Journal of Material Science: Materials in Medicine 27 (10), 159 (2016)

Within a collaboration between the Laboratory of Molecular Nanotechnology (University of Parma), prof. Piotr Warszynski (Polish Academy of Sciences, Krakow, Poland) and dr. Franca Albertini (IMEM-CNR, Parma), I studied polyelectrolyte capsules for cancer therapy that aim at combining triggered drug release and Magnetic Hyperthermia, a therapy that uses magnetically induced localized heating to kill cancer cells. The capsules developed in this collaboration incorporate superparamagnetic iron oxide nanoparticles; Under irradiation with magnetic fields oscillating in radiofrequency, capsules open to release their drug cargo, and they also heat the surrounding tissue. Within this project, I performed Magnetic Hyperthermia irradiation experiments and I checked the morphological alteration of the capsules, by means of Scanning Electron Microscopy and Dynamic Light Scattering measurements performed before and after irradiation.

This research resulted in this publication:

- ACS Appl. Mater. Interfaces 8, 38, 25043–25050 (2016)

Interfacial dynamics and mechanical properties of 2D systems at the air/water interface

Early in my post-doc research activity, I studied the interfacial dynamics and mechanical response of molecular/nanoparticle layers at the air/water interface; this prosecuted and completed the research of my Ph.D. topic. I investigated the aggregation processes that lead to the formation of 2D gel networks of gold nanoparticles, as their interfacial concentration is increased; we found that these processes can be described using concepts similar to those of percolation in random networks. I characterized the dynamical regimes and dynamical heterogeneities peculiar of these gel networks, using X-ray Photon Correlation Spectroscopy in Grazing Incidence geometry (GI-XPCS) performed at the air/water interface, combined with 2D microrheology measurements performed using a custom-build high-performance interfacial rheometer.

This research resulted in these publications:

- Physical Review E, 89 042308 (2014)
- Colloids and Surfaces A, 441, 912 (2013)
- Physical Review Letters 108, 105701, (2012)
- Colloids and Surfaces A, 413, 71 (2012)

Later, my research focused on the investigation of dynamical regimes of mixed layers of phospholipids and silica nanoparticles at the air/water interface, within a collaboration between the Laboratory of Molecular Nanotechnology (University of Parma) and dr. L. Liggieri and dr. F. Ravera from ICMATE-CNR (Genova). This study combined GI-XPCS and microrheology experiments with Epifluorescence Microscopy, Multiple Particle Tracking and Discrete Fourier Microscopy. The aim was to gain insight on the physical effects of nanoparticle adsorption on pulmonary surfactants and cellular membranes. This research highlighted and characterized the wide range of dynamical regimes induced by silica nanoparticles of different philicity, from Brownian diffusion to ballistic rearrangements. This gives insights on how nanoparticle adsorption could severely alter the mechanical response of model biological phospholipid structures.

This research resulted in these publications:

- Langmuir 30 (39), 11504-11512 (2014)
- Scientific Reports 5, 17930 (2015)
- Langmuir 32 (19), 4868-4876 (2016)

Dynamics of emulsions Building on the results obtained on single interfaces, I contributed to the study of structure and dynamics of complex systems at high density of interfaces, such as foams and emulsions. This research is framed within an international collaboration funded by the European Space Agency (ESA), started with the ESA-MAP project "Soft Matter Dynamics", where the Laboratory of Molecular Nanotechnology (University of Parma) was scientific partner of dr. L. Liggieri and dr. F. Ravera from ICMATE-CNR (Genova). This collaboration now continues in the ESA-MAP project "Emulsion Dynamics and Droplet Interfaces"(EDDI), of which the Laboratory of Molecular Nanotechnology (Univeristy of Parma) is a main partner. This project aims at studying the microscopic mechanisms that lead to emulsion destabilization, such as Ostwald Ripening and Coalescence. To cancel gravity-related effects, which causes sedimentation and creaming, the project plans experiments of Diffusing Wave Spectroscopy on a facility currently installed on the International Space Station. The DWS technique investigates structure and internal dynamics of turbid systems via the time-correlation analysis of coherent light scattered within the sample, in a multiple-scattering regime. Using an ad-hoc DWS setup developed in Parma, I studied emulsions where coalescence is suppressed by surfactants. In these systems, creaming leads to the formation of an arrested systems in which translations are suppressed, but that still shows residual dynamics. Our aim is identifying the origin of these dynamics, discriminating between shape fluctuations of droplets and interparticle rearrangements.

EDUCATION AND TRAINING

2009 – 2012 **Dottorato di Ricerca (Ph.D.) in Physics**

University of Parma, Parma, Italy

Title: "Dynamical and rheological characterization of 2D architectures at the air/water interface"

2006 – 2008 **Laurea Specialistica in Condensed Matter Physics**

University of Parma, Parma, Italy

International classification Master of Science degree

The final work illustrates the experimental results of the stage at the beamline ID10 at the European Synchrotron ESRF: "Structure and dynamics of equilibrium and non-equilibrium colloidal suspensions by means of X-rays Photon Correlation Spectroscopy (XPCS)". Graduated *cum laude*.

January 2008 – July 2008 **Erasmus Student**

Université Joseph Fourier, Grenoble (FR)

Stage at the European Synchrotron ESRF, working under the supervision of Andrei Fluerașu and Anders Madsen. I studied the structural and dynamical properties of suspensions of sterically stabilized PMMA particles in decalin, participating to several in-house XPCS and SAXS experiments on beamlines ID10 and ID02.

2003 – 2006 **Laurea Triennale in Physics**

University of Parma, Parma, Italy

International classification Bachelor degree

Final work on "Low-frequency Raman measurements on photosensitive glass-forming polymers". Graduated *cum laude*.

METRICHE DI PUBBLICAZIONE

I am author of **24** publications on scientific journals, with **12** as first author.

Scopus **24** publications, **236** citations, h-index: **10**. Consultato il 14-03-2019.

Web of Science **24** publications, **215** citations, h-index: **9**. Consultato il 14-03-2019.

ORCID: [0000-0003-3223-8622](https://orcid.org/0000-0003-3223-8622), SCOPUS ID: [36457245000](https://scopus.com/authid/detail.uri?authorId=36457245000)

ABILITAZIONE SCIENTIFICA
NAZIONALE 2016-201826/07/2018 - 26/07/2024 **Settore 02/B1, Fisica Sperimentale della Materia**

Abilitazione Scientifica Nazionale; Abilitato alla posizione di Professore di Seconda Fascia.

12/09/2018 - 12/09/2024 **Settore 02/D1, Fisica Applicata**

Abilitazione Scientifica Nazionale; Abilitato alla posizione di Professore di Seconda Fascia.

PRIZES**2011 Prize “Marco Fontana” 2011**

Awarded by *Società Italiana di Fisica* (Italian Physics Society, SIF) for the best Master thesis on a topic related to Soft Matter Physics.

2017 Young Researcher Call “NanoInnovation’s Got Talent”

Winner of the call for Young researcher (35 years or less) “NanoInnovation’s Got Talent”, sponsored by Fondazione Bracco in the framework of the “progettoDiventerò (Young People Project)” initiative - NanoInnovation 2017 Conference, Roma. The Call rewards young researchers for their activity in Nanotechnology.

2016 Best Poster Award, ESRF User Meeting 2016 (Grenoble) “2D dynamical arrest transition in nanoparticle-phospholipid layers studied in real and momentum spaces”

2012 Within my Ph.D., I contributed to the first XPCS experiment on a single interfacial layer at the air/water interface. The experiment resulted in the measurement of dynamical heterogeneities connected to cooperative rearrangements, by the first measurement of fourth-order correlation functions. I am first author of the paper that reports the results of this experiment, [Orsi et al, PRL 108, 105701 (2012)], that was awarded with the [cover of the issue](#).

The paper was also reported on the ESRF Highlights 2012, pag. 68-69.

GRANTS**2013 Grant “Spinner”, Regione Emilia-Romagna**

“Pathway for international collaboration on research projects with industrial interest”

Granted by Regione Emilia-Romagna (IT). The funds were used to work for 4 months as visiting researcher at the University of Cambridge (UK). During the visit, I worked with Dr. Pietro Cicuta (Cavendish Laboratory, Biological and Soft Systems Group). I studied how the analysis of thermal fluctuations of phospholipid vesicles can be used to obtain informations on their mechanical properties, addressing some experimental artefacts arising from the finite focal depth of the microscopy setup used.

The grant activities resulted in the following publications on high impact international journals:

- Physical Chemistry Chemical Physics 17 (24), 15615-15628 (2015)
- Soft Matter (Communication), 13, 3480-3483, (2017)

REFERRAL ACTIVITY**Referee on International Journals**

I reviewed papers for “Colloids and Surfaces B: Biointerfaces”, “Drug Delivery Today”.

MEMBERSHIP IN SCIENTIFIC NETWORKS**I participated to the following COST networks:**

- TD1402 (Member) Multifunctional Nanoparticles for Magnetic Hyperthermia and Indirect Radiation Therapy (RADIOMAG)
- MP1106 (Participant) Smart and green interfaces - from single bubbles and drops to industrial, environmental and biomedical applications
- CM1101 (Participant) Colloidal Aspects of Nanoscience for Innovative Processes and Materials

INVITATIONS TO CONFERENCES

Invited contributions to Conferences

- 2017 Nanoinnovation 2017 (Rome, IT), Session for young researchers "Nanoinnovation's got talent", "CeF3- ZnO nanostructures for the Self-lighted Photodynamic Therapy of deep tumors".
- 2016 ESRF User Meeting, "Microscopic dynamics in 2D phospholipid-nanoparticles films studied in real and momentum spaces".
- 2014 ESRF User Meeting, "Dynamics of a bidimensional gel around its percolation transition".

CONFERENCES & WORKSHOPS

Poster and Oral contributions to Conferences in the last 5 years

- 15-26/04/2013 Oral contribution - École de Physique des Houches, Water at Interfaces: New Developments in Physics, Chemistry and Biology - "Effect of macrolid antibiotic drugs on the mechanical properties of model biological membranes: passive rheology of DOPC GUVs" - Les Houches (FR)
- 21-26/07/2013 Poster Contribution - 7th International Discussion Meeting on Relaxations in Complex Systems - "Dynamics of DPPC-based foam-like 2D structures stabilized by silica nanoparticles" - Barcellona (ES)
- 09-13/09/2013 Oral Contribution - FisMat 2013, Italian National Conference on Condensed Matter Physics - "Structure, mechanical properties and dynamics of 2D DPPC based foam-like structures stabilized by silica nanoparticles" - Milano
- 03-05/02/2014 Invited speaker at ESRF User Meeting 2014, ERSF, Grenoble (FR) Parallel Session: "Structure of Soft Matter" "Dynamics of a bidimensional gel around its percolation transition"
- 31/03/ - 02/04/2014 Oral controbution - Joint meeting COST ACTION CM1101 - "Dynamics and structure of 2D foam-like structures", Genova
- 28/11/2014 Oral contribution - First Parma Nanoday - "Surprises from the microscopic dynamics in arrested systems" - Parma
- 03-04/12/2015 Poster Contribution - Second Parma Nanoday - "2D dynamical arrest transition in nanoparticle-phospholipid layers studied in real and momentum spaces" - Parma (IT)
- 08-10/02/2016 Poster contribution - ESRF User Meeting, "Microscopic dynamics in 2D phospholipid-nanoparticles films studied in real and momentum spaces". ESRF, Grenoble (FR) – Winner of Best Poster Prize
- 08-10/02/2016 Invited speaker at ESRF User Meeting 2016, ERSF, Grenoble (FR) User-dedicated microsymbosia "Dynamics of complex systems" Title: "Microscopic dynamics in 2D phospholipid-nanoparticles films studied in real and momentum spaces"
- 23-24/06/2016 Oral contribution - Italian Soft Days, 2nd edition - "The effect of silica nanoparticles on the dynamics of phospholipid films" - Milano (IT)
- 12-16/09/2016 Oral contribution - 4th International Soft Matter Conference - "Interfacial slow dynamics from the micro to the nanoscale by a combination of real and momentum space techniques" - Grenoble (FR)
- 12-14/07/2017 Poster contribution - Third Parma Nanoday - "An Inorganic nanostructure for an X-ray triggered therapy of deep tumors", Parma (IT)
- 20-23/09/2017 Oral contribution - COST TD1402 RADIOMAG workshop - "A multi-therapy strategy to treat deep tumors: Fe₃O₄-CeF₃-ZnO nanostructures to combine Magnetic Hyperthermia and Self-Lighted Photodynamic Therapy" - Bialystok (PL)
- 26-29/09/2017 Invited speaker at Nanoinnovation 2017, Roma (IT) Session for young researchers "Nanoinnovation's got talent" "CeF₃- ZnO nanostructures for the Self-lighted Photodynamic Therapy of deep tumors".
- 04-06/07/2017 Oral Contribution - XXIX Congresso Annuale SISN - Italian Neutron Scattering Conference INSC2018, Parma - "Neutron reflectivity of layers formed by nanoparticle-surfactant complexes at the oil/water interface".

- 02-07/09/2018 Poster Contribution - ECIS 2018, Ljubljana (SI) "Dynamics of photoswitchable smart worm-like micelles".
- 02-07/09/2018 Oral Contribution - ECIS 2018, Ljubljana (SI) "Emulsion stability at minimal surfactant concentrations".
- 16-18/10/2018 Oral contribution - COST TD1402 RADIOMAG workshop - "Multi-therapy strategies to treat deep tumors: Magnetic Hyperthermia, Self Lighted Photodynamic Therapy, Drug Delivery".

EXPERIMENTAL TECHNIQUES

I performed experiments with the following techniques

- Langmuir tensiometry at the air/water interface;
- Deposition of Langmuir layers with Langmuir-Blodgett e Langmuir-Schaefer techniques;
- Dynamic Light Scattering;
- Diffusing Wave Spectroscopy;
- Rheometry, both bulk rheometry and interfacial rheometry;
- Interfacial dynamics measurements by Multiple Particle Tracking, Discrete Fourier Microscopy, Differential Dynamic Microscopy;
- Epifluorescence Microscopy;
- Null-Ellipsometry and Brewster Angle Microscopy;
- Raman, Infrared, UV-vis and Fluorescence spectroscopies;
- Atomic Force Microscopy;
- Scanning Electron Microscopy, EDS spectroscopy.

I contributed to plan and perform experiments at Large Scale Facilities with the following techniques:

- Small-Angle and Wide-Angle X-ray Scattering;
- X-ray Photon Correlation Spectroscopy, in small angle scattering geometry and grazing-incidence geometry;
- X-ray Speckle Visibility Spectroscopy;
- X-ray and Neutron Reflectometry.

EXPERIMENTS AT LARGE SCALE FACILITIES

European Synchrotron Radiation Facility (ESRF, Grenoble, FR)

- As main proposer
- SC-2556 "XPCS study of the Q-dependence of the slow dynamics in a photosensitive poly-azo-acrylate glass-former" (2008)
 - SC-3536 "Are nanoparticles good tracers of the dynamics of polymers?" (2012)
 - SC-4442 "Superparamagnetic nanoparticles under radiofrequency magnetic fields: structural effects on phospholipid Langmuir monolayers" (2016)

- As co-proposer
- SC-2692 “Dynamics in colloidal gels under flow” (2008)
 - SC-2820 “Illumination and temperature dependence of the slow dynamics of a film of photosensitive azopolymer by surface XPCS” (2009)
 - MI-1015 “X-ray speckle visibility spectroscopy: A new tool to study dynamics at high brilliance light sources” (2009)
 - SC-2962 “Combining Interfacial Shear Rheology and XPCS measurements on a Langmuir monolayer” (2010)
 - SC-3288 “Dynamics of colloids at the air/water interface”(2011)
 - SC-3687 “Study of the interaction of nanoparticles with lipidic layers”(2012)
 - MI-1272 “XPCS experiments in Grazing Incidence on an interface between two immiscible liquids” (2016)
 - SC-4553 “Dynamics of a photo-rheological micelle system by XSVS” (2017)
 - SC-4824 “Investigation of Alpha-Beta Relaxation of Nano Particles Trapped in a Network of Smart Wormlike Micelles with XPCS and XSVS” (2018)
 - SC-4940 “The Dynamics of Nano Particles Trapped in a Network of Photo-Rheological Wormlike Micelles Under Various Confinement Conditions Studied with Microsecond XPCS and XSVS” (2018)

ISIS Neutron and Muon Source (Oxford, UK)

- As co-proposer
- RB1710368 “Nanoparticle-surfactant layers at the water-oil interface”, DOI: 10.5286/ISIS.E.84795006, (2017)

TECHING ACTIVITY

- 2018-2019 **"Laboratorio di Nanotecnologie Molecolari" - 6 crediti**
Laurea Magistrale in Fisica
Dipartimento di Scienze Matematiche, Fisiche e Informatiche, Università di Parma
- 2017-2018 **"Fisica Generale 1" - 9 crediti**
Laurea Triennale in Ingegneria dei Sistemi Informativi
Dipartimento di Ingegneria e Architettura, Università di Parma
- 2018 **E-Learning Course on Mechanics and Thermodynamics**
E-Learning Course on Mechanics and Thermodynamics for the web-portal EduOpen.org
Dipartimento di Scienze Matematiche, Fisiche e Informatiche, Università di Parma
- 2016 - oggi **Co-supervisor of the Ph.D. student Fabrizia Salerni, XXXII ciclo**
Dipartimento di Scienze Matematiche, Fisiche e Informatiche, Università di Parma. Title: "Soft Matter Dynamics. Investigation of the physical principles and factors which determine the stability of different emulsions and foams, by means of spectroscopy and microscopy techniques"
- 2010-2012 **Attività didattiche integrative in Fisica e Matematica**
Exercises, tutoring and exam assistance for Physics and Mathematics courses, Laurea Triennale in Scienze Gastronomiche, Laurea Triennale in Scienze e Tecnologie Alimentari
Facoltà di Agraria, Università di Parma
- 2012 - oggi **Supervisione di studenti delle Lauree in Fisica**
2018 Co-supervisor for the final thesis - Laurea Triennale of dr. Chiara Coppi
2017 Co-supervisor for the final thesis - Laurea Magistrale of dr. Emilio Macaluso
2015 Co-supervisor for the final thesis - Laurea of dr. Emilio Macaluso
2012 Co-supervisor for the final thesis - Laurea Magistrale of dr. Matteo Parmigiani

TECHNOLOGICAL TRANSFER

Technological transfer activities - Terza Missione

- 2010-2012 Collaboration with Puro S.R.L., Bannone di Traversetolo (PR), to develop a UV sensor for an industrial device for purification and sterilization of water and food-grade liquids.
- 2011-2013 Collaboration with prof. Rivetti (Dipartimento di Bioscienze, Università di Parma) and Chiesi Farmaceutici (Parma) to characterize mono layers of pulmonary surfactants (natural and synthetic) by means of Epifluorescence Microscopy, AFM and Langmuir isotherms.
- 2013-2014 Research project in collaboration with Ferrero S.P.A., Alba (IT) to investigate the ageing process in chocolate-based products by means of Epifluorescence Microscopy, AFM, SEM.

PERSONAL SKILLS

Mother tongue Italian

Other languages	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C1	C1	C1	C1
French	A2	A2	A2	A2	A2

Levels: A1 and A2: Basic user – B1 and B2: Independent user – C1 and C2: Proficient user
[Common European Framework of Reference for Languages](#)

- Computer skills**
- Proficient with Linux/Windows Personal Computers
 - High-level programming skills in Matlab, Python and C++
 - High proficiency in interfacing hardware and instruments (cameras, spectrometers, acquisition boards) with a PC
 - High proficiency with Raspberry Pi and Arduino hardware
 - Competent with Microsoft Office programmes
 - Experience with HTML, CSS, Javascript, Wordpress, Php

dr. Davide Orsi - List of Publications

- [1] Anjali Devi Das, Giulia Mannoni, Andreas Fruh, Davide Orsi, Roberta Pinalli, and Enrico Dalcanale. “Damage-Reporting Carbon Fiber Epoxy Composites”. In: *ACS Applied Polymer Materials* (2019).
- [2] D Orsi, F Salerni, E Macaluso, E Santini, F Ravera, L Liggieri, and L Cristofolini. “Diffusing wave spectroscopy for investigating emulsions: I. Instrumental aspects”. In: *Colloids and Surfaces A: Physicochemical and Engineering Aspects* (2019), p. 123574.
- [3] F Salerni, D Orsi, E Santini, L Liggieri, F Ravera, and L Cristofolini. “Diffusing Wave Spectroscopy for Investigating Emulsions: II. Characterization of a paradigmatic oil-in-water emulsion”. In: *Colloids and Surfaces A: Physicochemical and Engineering Aspects* (2019), p. 123724.
- [4] Luigi Cristofolini, Davide Orsi, and Lucio Isa. “Characterization of the dynamics of interfaces and of interface-dominated systems via spectroscopy and microscopy techniques”. In: *Current Opinion in Colloid and Interface Science* 37 (2018), pp. 13–32.
- [5] F Cugini, D Orsi, E Brück, and M Solzi. “Direct measurement of the magnetocaloric effect on micrometric Ni-Mn-(In, Sn) ribbons by the mirage effect under pulsed magnetic field”. In: *Applied Physics Letters* 113.23 (2018), p. 232405.
- [6] Sara Llamas, Eva Santini, Libero Liggieri, Fabrizia Salerni, Davide Orsi, Luigi Cristofolini, and Francesca Ravera. “Adsorption of Sodium Dodecyl Sulfate at Water–Dodecane Interface in Relation to the Oil in Water Emulsion Properties”. In: *Langmuir* 34.21 (2018), pp. 5978–5989.
- [7] Davide Orsi, Tiziano Rimoldi, Silvana Pinelli, Rossella Alinovi, Matteo Goldoni, Giovanna Benecchi, Francesca Rossi, and Luigi Cristofolini. “New CeF₃-ZnO nanocomposites for self-lighted photodynamic therapy that block adenocarcinoma cell life cycle”. In: *Nanomedicine* 13.18 (2018), pp. 2311–2326.
- [8] F. Cugini, G. Porcari, T. Rimoldi, D. Orsi, S. Fabbri, F. Albertini, and M. Solzi. “On the Broadening of the Martensitic Transition in Heusler Alloys: From Microscopic Features to Magnetocaloric Properties”. In: *JOM* 69 (2017), pp. 1422–1426.
- [9] M. Negri, M. Bosi, D. Orsi, T. Rimoldi, G. Attolini, E. Buffagni, C. Ferrari, L. Cristofolini, and G. Salviati. “Effect of a halogen-based precursor on dopant incorporation in 3C-SiC film epitaxy”. In: *Journal of Materials Science* 52 (2017), pp. 9787–9793.
- [10] S. Alex Rautu, Davide Orsi, Lorenzo Di Michele, George Rowlands, Pietro Cicuta, and Matthew S. Turner. “The role of optical projection in the analysis of membrane fluctuations”. In: *Soft Matter* 13 (2017), pp. 3480–3483.
- [11] Luigi Cristofolini, Krzysztof Piotr Szczepanowicz, Davide Orsi, Tiziano Rimoldi, Franca Albertini, and Piotr Warszynski. “Hybrid polyelectrolyte/Fe₃O₄ nanocapsules for hyperthermia applications”. In: *ACS Applied Materials & Interfaces* (2016).
- [12] D. Orsi, A.E. Früh, M. Giannetto, L. Cristofolini, and E. Dalcanale. “Electrochemical decompatibilisation leads to morphology rearrangements in host-guest polymer blend films”. In: *Soft Matter* 12.24 (2016), pp. 5353–5358.

- [13] D. Orsi, T. Rimoldi, E. Guzmán, L. Liggieri, F. Ravera, B. Ruta, and L. Cristofolini. “Hydrophobic Silica Nanoparticles Induce Gel Phases in Phospholipid Monolayers”. In: *Langmuir* 32.19 (2016), pp. 4868–4876.
- [14] Tiziano Rimoldi, Davide Orsi, Paola Lagonegro, Benedetta Ghezzi, Carlo Galli, Francesca Rossi, Giancarlo Salviati, and Luigi Cristofolini. “CeF₃-ZnO scintillating nanocomposite for self-lighted photodynamic therapy of cancer”. In: *Journal of Materials Science: Materials in Medicine* 27.10 (2016), pp. 1–9.
- [15] Daniele Masseroni, Enrico Rampazzo, Federico Rastrelli, Davide Orsi, Lucia Ricci, Giacomo Ruggeri, and Enrico Dalcanale. “pH-responsive host–guest polymerization and blending”. In: *RSC Adv.* 5.15 (2015), pp. 11334–11342.
- [16] Davide Orsi, Eduardo Guzmán, Libero Liggieri, Francesca Ravera, Beatrice Ruta, Yuriy Chushkin, Tiziano Rimoldi, and Luigi Cristofolini. “2D dynamical arrest transition in a mixed nanoparticle-phospholipid layer studied in real and momentum spaces”. In: *Scientific Reports* 5 (2015), p. 17930.
- [17] S.F. Shimobayashi, B.M. Mognetti, L. Parolini, D. Orsi, P. Cicuta, and L. Di Michele. “Direct measurement of DNA-mediated adhesion between lipid bilayers”. In: *Physical Chemistry Chemical Physics* 17.24 (2015), pp. 15615–15628.
- [18] E. Guzmán, D. Orsi, L. Cristofolini, L. Liggieri, and F. Ravera. “Two-Dimensional DPPC based emulsion-like structures stabilized by silica nanoparticles”. In: *Langmuir* 30.39 (2014), pp. 11504–11512.
- [19] L. Li, P. Kwasniewski, D. Orsi, L. Wiegart, L. Cristofolini, C. Caronna, and A. Fluerasu. “Photon statistics and speckle visibility spectroscopy with partially coherent X-rays”. In: *Journal of Synchrotron Radiation* 21.6 (2014), pp. 1288–1295.
- [20] D. Orsi, B. Ruta, Y. Chushkin, A. Pucci, G. Ruggeri, G. Baldi, T. Rimoldi, and L. Cristofolini. “Controlling the dynamics of a bidimensional gel above and below its percolation transition”. In: *Physical Review E* 89.4 (2014).
- [21] Davide Orsi, Alessandro Vezzani, Raffaella Burioni, Andrea Pucci, Giacomo Ruggeri, and Luigi Cristofolini. “Statistical properties and morphology of a 2D gel network at the air/water interface”. In: *Colloids and Surfaces A* 441 (2014), pp. 912–918.
- [22] D. Orsi, L. Cristofolini, G. Baldi, and A. Madsen. “Heterogeneous and anisotropic dynamics of a 2D Gel”. In: *Physical Review Letters* 108.10 (2012).
- [23] Davide Orsi, Giacomo Baldi, Pietro Cicuta, and Luigi Cristofolini. “On the relation between hierarchical morphology and mechanical properties of a colloidal 2D gel system”. In: *Colloids and Surfaces A* 413 (2012), pp. 71–77.
- [24] Davide Orsi, Andrei Fluerasu, Abdellatif Moussaïd, Federico Zontone, Luigi Cristofolini, and Anders Madsen. “Dynamics in dense hard-sphere colloidal suspensions”. In: *Physical Review E* 85.1 (2012).
- [25] Davide Orsi, Luigi Cristofolini, and Marco P. Fontana. “Equilibrium and out-of-equilibrium dynamics in a molecular layer of azopolymer floating on water studied by Interfacial Shear Rheology”. In: *Journal of Non-Crystalline Solids* 357.2 (2011), pp. 580–586.
- [26] Davide Orsi, Luigi Cristofolini, Marco P. Fontana, Emanuele Pontecorvo, Chiara Caronna, Andrei Fluerasu, Federico Zontone, and Anders Madsen. “Microscopic dynamics in nanocomposite photosensitive films studied by X-ray photon correlation spectroscopy”. In: *Philosophical Magazine* 91.13-15 (2011), pp. 1836–1846.

- [27] D. Orsi, L. Cristofolini, M.P. Fontana, E. Pontecorvo, C. Caronna, A. Fluerasu, F. Zontone, and A. Madsen. “Slow dynamics in an azopolymer molecular layer studied by x-ray photon correlation spectroscopy”. In: *Physical Review E* 82.3 (2010).