

Soft.Matter@PT 2015

Book of *Precedings*

2 -3 July 2015

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Luis Ever Aguirre

Institution: I3N - CENIMAT, and Departamento de Ciência dos Materiais, Faculdade de Ciências e Tecnologia, FCT/UNL

E-mail: l.aguirre@fct.unl.pt

Web: <http://www.cenimat.fct.unl.pt/people/luis-ever-aguirre>

ResearcherID: J-5243-2013

LinkedIn: <https://pt.linkedin.com/in/luiseveraguirre>

ResearchGate: www.researchgate.net/profile/Luis_Aguirre15

Expertise: Interfaces and wetting of simple fluids and liquid crystals

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental		✓	✓					
Computacional								
Theoretical		✓						

Description of expertise:

- Sensing nano/micro structures in cellulosic fibers by liquid crystal droplets.
- Develop of liquid crystal light shutters.
- Mechanical properties of thin films made from liquid crystalline polymers.

Selected Publications (max 5):

- “Regular structures in 5CB liquid crystals under the joint action of ac and dc voltages”, [Physical Review E 85, 041703 \(2012\)](#);
- “On The Acoustic -Director Interaction in the Smectic A Phase”. [Chemical Physics Letters 450, 170 \(2007\)](#).

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Ana Almeida

Institution: Cenimat – I3N and DCM FCT-UNL

E-mail: Ana.almeida@fct.unl.pt

Web: <http://www.cenimat.fct.unl.pt/people/ana-patricia-correia-almeida>

ResearcherID:

LinkedIn: <https://pt.linkedin.com/in/anapatriciaalmeida>

ResearchGate:

Expertise: Interfaces and wetting of simple fluids and liquid crystals

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental		✓	✓	✓	✓		✓	Supercritical Fluids
Computacional								
Theoretical								

Description of expertise:

- Static and Dynamic Contact angle measurements, Surface free energy calculations and adhesion measurements determination.
- Liquid crystalline cellulose based systems and active materials.
- Synthesis/preparation and characterization of novel polymers fibers: Electrospinning, Force-spinning and electrospray.
- Biological properties of the active components assessed at cellular level in appropriate cell lines searching for protection responses to environmental stresses and cell death signals.
- Antimicrobial efficiency test of fibers.
- Encapsulation and micronization of active compounds using non-conventional techniques, namely supercritical Fluid technology.

Selected Publications (max 5):

- *Down conversion photoluminescence on PVP/Ag-nanoparticles electrospun composite fibers*, [*Optical Materials* 39 \(2015\) 278–281](#);
- *Microencapsulation of Oregano essential oil in starch-based materials using Supercritical Fluid Technology*, [*Innovative Food Science & Emerging Technologies*, 20, 140-145. \(2013\)](#);
- *Supercritical fluids strategies to produce hybrid structures for drug delivery in Novel Concepts in Drug Delivery*, [*Journal of Controlled Release*, 148, e7–e20 \(2010\)](#);
- *Processing Triacetyl- β -Cyclodextrin in the liquid phase using supercritical CO₂*, [*Journal of Supercritical Fluids* 54, 357-361 \(2010\)](#);
- *Processing cherries (*Prunus avium*) using supercritical fluid technology. Part 2- Evaluation of SCF extracts as promising natural chemotherapeutical agents*, [*Journal of Supercritical Fluids*, 55, 1007-1013 \(2011\)](#).

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Pedro Marques de Almeida

Institution: ISEL/IPL and CENIMAT – FCT/UNL

E-mail: palmeida@adf.isel.pt

Web: <https://www.isel.pt/fisica/pedroalmeida.html>

ResearcherID: B-4356-2009

LinkedIn: <https://pt.linkedin.com/in/pedromaiaalmeida>

ResearchGate: https://www.researchgate.net/profile/Pedro_Almeida17

Expertise: Liquid crystals and their applications, Electro-optics, Solid state NMR.

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental		✓	✓				✓	
Computacional								
Theoretical								

Description of expertise:

- Fundamental studies of Liquid crystals.
- Development and optimization of liquid crystal applications.
- Study of liquid crystalline polymers.
- Solida state NMR, Rheo-NMR.

Selected Publications (max 5):

- *Deuterium NMR studies of orientational order in Cellulosic network Micro Fibers*, [*Macromolecules*, 43, 5749 \(2010\)](#);
- *Liquid crystal beads constrained on thin cellulosic fibers: electric field induced microrotors and N-I transition*, [*Soft Matter*, 8, 3634 \(2012\)](#);
- *A cellulose liquid crystal motor: a steam engine of the second kind*, [*Scientific Reports*, 3, 1028 \(2013\)](#);
- *Liquid Crystal Necklaces: Cholesteric Drops Threaded by Thin Cellulose Fibres*, [*Soft Matter*, 9, 7928 \(2013\)](#);
- Y. Geng, P.L. Almeida, G. Feio, J.L. Figueirinhas and M.H. Godinho, "Water Based Cellulose Liquid Crystal System Investigated by Rheo-NMR", [*Macromolecules*, 46, 4296 \(2013\)](#).

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Rodrigo F. M. de Almeida

Institution: CQB - University of Lisbon

E-mail: rfalmeida@fc.ul.pt

Web: <http://www.fc.ul.pt/node/2224>

ResearcherID: D-8629-2012

ResearchGate: https://www.researchgate.net/profile/Rodrigo_De_Almeida2

Expertise: Biomembrane molecular biophysics and biochemistry

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental	✓			✓			✓	
Computacional								
Theoretical								

Description of expertise:

- Fluorescence spectroscopy.
- Liposomes and supported lipid bilayers preparation and characterization.
- Imaging of lipid nano/microdomains.
- Drug-biomolecule (lipid, protein, DNA) interactions.

Selected Publications (max 5):

- *A Biomimetic Platform to Study the Interactions of Bioelectroactive Molecules with Lipid Nanodomains*, [*Langmuir*, 30, 12627 \(2014\)](#);
- *Changes in membrane organization upon spontaneous insertion of 2-hydroxylated unsaturated fatty acids in the lipid bilayer*, [*Langmuir*, 30, 2117 \(2014\)](#);
- *Crystallization around solid-like nanosized docks can explain the specificity, diversity and stability of membrane microdomains*, [*Front. Plant Sci.*, 5, 72 \(2014\)](#);
- *Biomimetic membrane rafts stably supported on unmodified gold*, [*Soft Matter*, 8, 2007 \(2012\)](#);
- *Gel domains in the plasma membrane of *Saccharomyces cerevisiae*: highly ordered. sphingolipid-enriched, ergosterol-free lipid rafts*, [*J. Biol. Chem.*, 286, 5043 \(2011\)](#).

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Filipa Alves

Institution: Instituto Gulbenkian de Ciência
E-mail: filipaalves@igc.gulbenkian.pt
Web: http://www.igc.gulbenkian.pt/pages/groups.php/A=117_collection=groups_group=1
ResearcherID: A-2876-2011
LinkedIn: <https://www.linkedin.com/in/filipaalves>
ResearchGate: https://www.researchgate.net/profile/Filipa_Alves4

Expertise: Mathematical modeling in biophysics and developmental biology

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental							✓	
Computacional							✓	
Theoretical							✓	

Description of expertise:

- Theoretical biophysics and developmental biology.
- Computational models of biological pattern formation, genetic regulatory networks and metabolic regulation.
- Quantitative image analysis.

Selected Publications (max 5):

- Michard E, Alves F & Feijó JA. The role of ion fluxes in polarized cell growth and morphogenesis: the pollen tube as an experimental paradigm [Int J Dev Biol 53 : 1609-1622](#);
- Alves F & Dilão R. Modeling segmental patterning in *Drosophila*: maternal and gap genes, [J. Theor. Biol. 241\(2\) : 342-359](#);
- Alves F & Dilão R. A software tool to model genetic regulatory networks: applications to segmental patterning in *Drosophila*, in: [R.P. Mondaini and R. Dilão \(ed.\), BIOMAT 2005, Proc Int Symp Math Comp Biol, World Scientific, pp. 71-88](#);
- Alves F & Dilão R. A simple framework to describe the regulation of gene expression in prokaryotes [C.R. Biologies 328\(5\) : 429-444](#).

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Manuel A. Alves

Institution: CEFT – Universidade Porto – Faculdade Engenharia
E-mail: mmalves@fe.up.pt
Web: <http://paginas.fe.up.pt/~mmalves>
ResearcherID: <http://www.researcherid.com/rid/A-9394-2008>
ResearchGate: http://www.researchgate.net/profile/Manuel_Alves4
ORCID: <http://orcid.org/0000-0001-6585-6609>

Expertise: Computational rheology; Microfluidics with complex fluids; Non-Newtonian Fluids

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental	✓		✓	✓	✓	✓	✓	
Computacional			✓	✓		✓	✓	
Theoretical			✓					

Description of expertise:

- Theoretical, Experimental and Computational Fluid Dynamics.
- Computational Rheology; Purely Elastic Flow Instabilities; Elastic Turbulence.
- Transport Phenomena in Porous Media.

Selected Publications (max 5):

- J. Zitz, C. Schäfer, C. Wagner, R. J. Poole, M. A. Alves, A. Lindner, "Serpentine channels: micro-rheometers for fluid relaxation times", [*Lab on a Chip*, **14** \(2014\) 351-358](#);
- S. J. Haward, M. S. N. Oliveira, M. A. Alves, G. H. McKinley, "Optimized cross-slot flow geometry for microfluidic extensional rheometry", [*Physical Review Letters*, **109** \(2012\) 128301](#);
- M. S. N. Oliveira, F. T. Pinho, M. A. Alves, "Divergent streamlines and free vortices in Newtonian fluid flows in microfluidic flow focusing devices", [*J. Fluid Mechanics*, **711** \(2012\) 171-191](#);
- R. J. Poole, M. A. Alves, P. J. Oliveira, "Purely-elastic flow asymmetries", [*Physical Review Letters*, **99** \(2007\) 164503](#);
- M. A. Alves, P. J. Oliveira, F. T. Pinho, "A convergent and universally bounded interpolation scheme for the treatment of advection", [*Int. J. Numerical Methods in Fluids*, **41** \(2003\) 47-75](#).

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Maria Rute de Amorim e Sá Ferreira André

Institution: Department of Physics and CICECO – Aveiro Institute of Materials, University of Aveiro

E-mail: rferreira@ua.pt

Web: <http://www.ciceco.ua.pt/RuteAndre>

ResearcherID: F-4562-2011

Expertise: Interfaces and wetting of simple fluids and liquid crystals

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Lanthanide ions	Organic-inorganic hybrids
Experimental			✓					✓	✓
Computacional									
Theoretical								✓	✓

Description of expertise:

- Optoelectronic properties of organic/inorganic hybrids without metal activator centres and doped with lanthanide ions, nanoparticles of semiconductor and oxide materials.
- Optical (photoluminescence in steady-state, time resolved modes, and quantum yield, as well as UV/Vis/NIR spectroscopy) and structural (XRD, SAXS, NMR, Raman, and Fourier-transform infrared spectroscopies) characterization of hybrid materials.
- Characterization of waveguiding performance of organic-inorganic hybrids and on spectroscopic ellipsometry, including optimization of modelling algorithms.
- Applications in the fields of optoelectronics and photonics (phosphors, solid-state lighting, and integrated optics) and photovoltaics (luminescent solar concentrators).

Selected Publications (max 5):

- Luminescent solar concentrators. [Sol. Energ. Mat. Sol. Cells. 138, 51 \(2015\);](#)
- Single-phase white LEDs. [Nat. Commun. 5, 5702 \(2014\);](#)
- Photonic-on-a-chip. [Laser Photonics Rev. 7, 1027 \(2013\);](#)
- Organic-inorganic hybrid phosphors. [Chem. Soc. Rev. 40, 536 \(2011\);](#)
- Lanthanide-Containing Hybrids, [Adv. Mater. 21, 509 \(2009\).](#)

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Nuno M. A. M. Araújo

Institution: CFTC - University of Lisbon
E-mail: nmaraujo@fc.ul.pt
Web: <http://www.namaraujo.net>
ResearcherID: B-6313-2008
LinkedIn:
ResearchGate: www.researchgate.net/profile/Nuno_Araujo2

Expertise: Interfaces and wetting of simple fluids and liquid crystals

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental								
Computacional	✓			✓		✓		
Theoretical	✓			✓		✓		

Description of expertise:

- Statistical Physics.
- Numerical simulations.
- Phase transitions and critical phenomena.
- Physics of colloids and granular materials.

Selected Publications (max 5):

- *Explosive percolation via control of the largest cluster*, [Physical Review Letters 105, 035701 \(2010\)](#);
- *Fracturing highly disordered materials*, [Physical Review Letters 109, 255701 \(2012\)](#);
- *Midair collisions enhance saltation*, [Physical Review Letters 111, 058001 \(2013\)](#);
- *Kinetic roughening of aggregates of patchy colloids with strong and weak bonds*, [EPL 107, 56002 \(2014\)](#);
- *Explosive electric breakdown due to conducting-particle deposition on an insulating substrate*, [Physical Review Letters 113, 155701 \(2014\)](#).

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Vera M. O. Batista

Institution: CFTC - University of Lisbon
E-mail: vmbatista@fc.ul.pt
Web: <http://cftc.fc.ul.pt/membro.php?username=vera>
ResearcherID:
linkedIn: <https://pt.linkedin.com/pub/vera-batista/15/825/282>
ResearchGate: www.researchgate.net/profile/Vera_Batista

Expertise: Flow of liquid crystals and nematic liquid crystal drops on fibers

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental								
Computacional	✓	✓						
Theoretical	✓	✓						

Description of expertise:

- Theoretical and Computational.
- Lattice-Boltzmann simulations.
- Monte Carlo simulations, free energy calculations, shape deformation of colloids.

Selected Publications (max 5):

- *The effect of anchoring on nematic flow in channels*, V.M.O. Batista, M. L. Blow and M. M. Telo da Gama, *Soft Matter*, 2015, DOI: [10.1039/C5SM00249D](https://doi.org/10.1039/C5SM00249D);
- *Crystallization of deformable spherical colloids*, Vera M.O. Batista and Mark A. Miller, *Physical Review Letters*, 105, 088305 (2010).

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Francisco Braz

Institution: CFTC - University of Lisbon
E-mail: franciscomoreirabraz@gmail.com
Web:
ResearcherID:
LinkedIn:
ResearchGate:

Expertise: Shortly working with interfaces in liquid crystals

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental								
Computacional								
Theoretical								

Description of expertise:

- Theoretical.
- Calculation of surface tension, contact angle, and wetting properties using Landau-de Gennes theory.
- Numerical calculation of configurations of cholesteric and blue phase liquid crystals.

Selected Publications (max 5):

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João Paulo Heitor Godinho Canejo

Institution: Cenimat/I3N – DCM UNL/FCT

E-mail: jpgc@campus.fct.unl.pt

Web: <http://www.cenimat.fct.unl.pt/people/joao-paulo-heitor-godinho-canejo>

ResearcherID: J-5011-2013

LinkedIn:

ResearchGate:

Expertise: Nanoparticles, Liquid Crystal Elastomers, Cellulosic Liquid Crystals

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental		✓	✓		✓			
Computacional								
Theoretical								

Description of expertise:

- Production of non-woven cellulosic membranes from liquid crystalline phases.
- Morphological characterization by Scanning Electron Microscopy.

Selected Publications (max 5):

- *Helical Twisting of Electrospun Liquid Crystalline Cellulose Micro- and Nanofibers*, [Advanced Materials 2008, 20, 4821-4825](#);
- *How to mimic the shapes of plant tendrils on the nano and microscale: spirals and helices of electrospun liquid crystalline cellulose derivatives*, [Soft Matter, 2009, 5, 2772](#);
- *Self-winding of helices in plant tendrils and cellulose liquid crystal fibers*, [Soft Matter, 2010, 6, 5965](#);
- *Cellulose Perversions*, [Materials, 2013, 6, 4, 1377 - 1390](#).

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Elisabete M. S. Castanheira

Institution: Centre of Physics – Minho University
E-mail: ecoutinho@fisica.uminho.pt
ResearcherID: A-4407-2013
OrcID: <http://orcid.org/0000-0002-5829-6081>
ResearchGate: www.researchgate.net/profile/Elisabete_Castanheira2

Expertise: Magnetoliposomes, nanoliposomes and new biocompatible peptide hydrogels as antitumor drug nanocarriers

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental	✓		✓	✓				
Computacional								
Theoretical								

Description of expertise:

- Experimental: preparation of liposomes and magnetoliposomes (liposomes entrapping magnetic nanoparticles).
- Photophysical behavior of fluorescent antitumor drugs and drug-loaded systems (liposome-based systems and hydrogels).
- Experimental techniques: Fluorescence, FRET, Langmuir-Blodgett films, liposome preparation techniques.

Selected Publications (max 5):

- *Magnetoliposomes based on nickel/silica core/shell nanoparticles: synthesis and characterization*, [*Materials Chemistry and Physics*, **148**, 978 \(2014\)](#);
- *A New Antitumoral Heteroarylaminothieno[3,2-b]pyridine Derivative: Incorporation in Liposomes and Interaction with Proteins Monitored by Fluorescence*, [*Photochemical & Photobiological Sciences*, **13**, 1730 \(2014\)](#);
- *Fluorescence studies on potential antitumor 6-(hetero)arylthieno[3,2-b]pyridine derivatives in solution and in nanoliposomes*, [*Journal of Photochemistry and Photobiology A: Chemistry* **264**, 56 \(2013\)](#);
- *Nanoliposomes for encapsulation and delivery of the potential antitumoral methyl 6-methoxy-3-(4-methoxyphenyl)-1H-indole-2-carboxylate*, [*Nanoscale Research Letters*, **6**, 482 \(2011\)](#).

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Paulo J. G. Coutinho

Institution: Centre of Physics – Minho University

E-mail: pcoutinho@fisica.uminho.pt

ResearcherID: A-4466-2013

OrcID: <http://orcid.org/0000-0003-4426-9207>

ResearchGate: http://www.researchgate.net/profile/Paulo_Coutinho4

Expertise: Magnetic nanoparticles, quantum dots, metallic nanoparticles, bioconjugates

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental	✓			✓	✓			Quantum Dots
Computational								(molecular quantum mechanics)
Theoretical								

Description of expertise:

- Experimental: preparation of nanoparticles (magnetic, semiconductor, metallic).
- Photophysical behavior of new fluorescent compounds/fluorescence probes.
- Experimental techniques: Fluorescence, FRET, XRD, Dynamic Light Scattering.
- Molecular quantum mechanical calculations with Gaussian software.

Selected Publications (max 5):

- *Energy Transfer via Exciton Transport in Quantum Dot Based Self-Assembled Fractal Structures*, [*Journal of Physical Chemistry C*, 118, 4982 \(2014\)](#);
- *Magnetoliposomes based on nickel/silica core/shell nanoparticles: synthesis and characterization*, [*Materials Chemistry and Physics*, 148, 978 \(2014\)](#);
- *Synthesis of new benzo[a]phenoxazinium probes possessing carboxylic ester, hydroxyl and amino functional groups: photophysical studies in dry ethanol and conjugation with CdTe quantum dots*, [*Dyes and Pigments*, 110, 203 \(2014\)](#);
- *Benzothienoquinolines: new one-pot synthesis and fluorescence studies of their interaction with DNA and polynucleotides*, [*Journal of Photochemistry and Photobiology A: Chemistry* 294, 20 \(2014\)](#).

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Cristóvão de Sousa Dias

Institution: CFTC - University of Lisbon
E-mail: csdias@fc.ul.pt
Web: <http://cftc.cii.fc.ul.pt/membro.php?username=cristovao>
ResearcherID: F-5566-2012
LinkedIn:
ResearchGate:

Expertise: Complex colloids on substrates and at interfaces

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental								
Computacional	✓			✓				
Theoretical	✓			✓				

Description of expertise:

- Computational methods.
- Monte Carlo simulations of the aggregation of patchy colloids on substrates and interfaces.
- Molecular dynamics simulations of the relaxation dynamics of films of complex colloids.

Selected Publications (max 5):

- *Adsorbed films of three-patch colloids: Continuous and discontinuous transitions between thick and thin films*, C. S. Dias, N. A. M. Araújo, and M. M. Telo da Gama. [*Physical Review E* 90, 032302 \(2014\)](#);
- *Kinetic roughening of aggregates of patchy colloids with strong and weak bonds*, C. S. Dias, N. A. M. Araújo, and M. M. Telo da Gama. [*EPL* 107, 56002 \(2014\)](#);
- *Mixtures of functionalized colloids on substrates*, C. S. Dias, N. A. M. Araújo, and M. M. Telo da Gama. [*Journal of Chemical Physics* 139, 154903 \(2013\)](#);
- *Non-equilibrium adsorption of 2AnB patchy colloids on substrates*, C. S. Dias, N. A. M. Araújo, and M. M. Telo da Gama. [*Soft Matter* 9, 5616 \(2013\)](#);
- *Nonequilibrium growth of patchy-colloid networks on substrates*, C. S. Dias, N. A. M. Araújo, and M. M. Telo da Gama. [*Physical Review E* 87, 032308 \(2013\)](#).

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Coro Echeverria

Institution: CENIMAT/I3N and DCM/FCT/UNL

E-mail: coro@fct.unl.pt

Web:

ResearcherID: A-1952-2009

LinkedIn:

ResearchGate: https://www.researchgate.net/profile/Coro_Echeverria

Expertise: Polymer Liquid Crystals, gels, microgels and rheology.

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental	✓		✓		✓			
Computacional								
Theoretical								

Description of expertise:

- Experimental.
- Polymer characterization. Analysis of structure-properties relationship.
- Synthesis and characterization of thermoresponsive microgels.

Selected Publications (max 5):

- *Rheo-NMR study of water-based cellulose liquid crystal system at high shear rates*, [*Polymer* 65, 18-25 \(2015\)](#);
- *Hybrid polystyrene based electrospun fibers with spin-crossover properties*. [*Journal of Polymer Science Part B: Polymer Physics* 53 \(11\), 814-821 \(2015\)](#);
- *Novel strategy for the determination of UCST-like microgels network structure: effect on swelling behavior and rheology*, [*Soft Matter*, 8 \(2\), 337-346 \(2012\)](#);
- *Effect of gold nanoparticles on the thermosensitivity, morphology, and optical properties of poly (acrylamide–acrylic acid) microgels*, [*Macromolecular Rapid Communications*, 31 \(1\), 54-58 \(2010\)](#);
- *UCST Responsive Microgels of Poly (acrylamide– acrylic acid) Copolymers: Structure and Viscoelastic Properties*, [*Macromolecules* 42 \(22\), 9118-9123 \(2009\)](#).

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Susete Nogueira Fernandes

Institution: CENIMAT/I3N, FCT/UNL
E-mail: sm.fernandes@fct.unl.pt
Web: <http://www.cenimat.fct.unl.pt/people/susete-nogueira-fernandes>
ResearcherID: J-5065-2013
LinkedIn: <https://pt.linkedin.com/pub/susete-fernandes/a/b07/756>
ResearchGate: https://www.researchgate.net/profile/Susete_Fernandes

Expertise: Interfaces and wetting of simple fluids and liquid crystals

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental	✓	✓	✓					✓
Computacional								
Theoretical								

Description of expertise:

- Organic and polymer synthesis and characterization. Synthesis of liquid crystals and cellulose derivatives.
- Preparation of micro and nano- membranes/wires/structures from liquid crystalline solutions, to originate high-added value materials.

Selected Publications (max 5):

- *Structural Color and Iridescence in Transparent Sheared Cellulosic Films*, [Macromol. Chem. Phys., 214 \(1\), 25-32, 2013. Journal's front cover](#);
- *A cellulose liquid crystal motor: a steam engine of the second kind*, [Scientific Reports, 3, article number 1028, 2013](#);
- *Nanocrystalline Cellulose Applied Simultaneously as Gate Dielectric and Substrate on Flexible Field Effect Transistors*, [Nanotechnology, 25 \(9\). Article number 094008, 2014 Journal's front cover](#);
- *^1H - ^2H Cross-Relaxation Study in a Partially Deuterated Nematic Liquid Crystal*, [Journal of Physical Chemistry B, 118, 5600-5607, 2014](#);
- *Revealing the Hierarchical Mechanical Strength of Single Cellulose Acetate Electrospun Filaments through Ultrasonic Breakage*, [Macromol. Rapid Commun. DOI: 10.1002/marc.201500087 \(2015\)](#).

Soft.Matter@PT 2015

António Luís Ferreira

Institution: Departamento de Física da Universidade de Aveiro and Institute of Nanostructures, Nanomodelling and Nanofabrication (I3N)

E-mail: alf@ua.pt

Web: <http://www.i3n.org/Person.aspx?id=29>

ResearcherID: A-7041-2010

LinkedIn: <https://www.linkedin.com/profile/view?id=67516957>

ResearchGate: http://www.researchgate.net/profile/Antonio_Ferreira14

Expertise: Interfaces and wetting of simple fluids and liquid crystals

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental								
Computational								✓
Theoretical								✓

Description of expertise:

- Phase diagram and free-energy calculations.
- Physics of Complex Systems.
- Monte Carlo Methods.

Selected Publications (max 5):

- *Emergence of social structures via preferential selection*, Adam Lipowski, Dorota Lipowska, and Antonio Luis Ferreira, [Phys. Rev. E 90, 032817 \(2014\)](#);
- *Critical behavior of a tumor growth model: Directed percolation with a mean-field flavor*, Lipowski, Adam; Ferreira, Antonio Luis; Wendykier, Jacek, [Phys. Rev. E, 86, 4, 041138 \(2012\)](#);
- *Determination of the solid-fluid coexistence of the n-6 Lennard-Jones system from free energy calculations*, Sousa, J. M. G.; Ferreira, A. L.; Barroso, M. A., [J. Chem. Phys. 136, 174502 \(2012\)](#);
- *Temperature Dependence of the Henry's Law Constant for Hydrogen Storage in NaA Zeolites: A Monte Carlo Simulation Study*, Sousa, Joao Miguel; Ferreira, Antonio Luis; Fagg, Duncan Paul; et al., [J. Nanoscience and Nanotechnology, 12, 6785-6791 \(2012\)](#);
- *Statistical mechanics model of angiogenic tumor growth*, Ferreira, Antonio Luis; Lipowska, Dorota; Lipowski, Adam, [Phys. Rev. E, 85, 010901 \(2012\)](#).

Soft.Matter@PT 2015

Eduardo J. M. Filipe

Institution: Centro de Química Estrutural – Instituto Superior Técnico – U. Lisboa

E-mail: efilipe@tecnico.ulisboa.pt

Web: http://cqe.ist.utl.pt/members/group3_memb.php

ResearcherID: G-1239-2014

LinkedIn:

ResearchGate: https://www.researchgate.net/profile/Eduardo_Filipe

Expertise: Interfaces and wetting of simple fluids and liquid crystals

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental	✓			✓				
Computacional	✓			✓				
Theoretical								

Description of expertise:

- Fluorinated surfactants.
- Measurement of surface/interfacial tension.
- Langmuir films.
- Molecular dynamics simulations.

Selected Publications (max 5):

- *Cation Alkyl Side Chain Length and Symmetry Effects on the Surface Tension of Ionic Liquids*, [Langmuir 30, 6408 \(2014\)](#);
- *Evidence for Interaction with the water subphase as the origin and stabilization of nano-domain in semi-fluorinated alkanes monolayer at the air-water interface*, [Langmuir 30, 15193 \(2014\)](#);
- *Highly Organized Crystalline Monolayer of a Semi-Fluorinated Alkane on a Solid Substrate obtained by spin-coating*, [Thin Solid Films 519, 414 \(2010\)](#);
- *Vapor Pressure of Perfluoroalkylalkanes: The Role of the Dipole*, [J. Phys. Chem. B 119, 1623 \(2015\)](#);
- *Nanoscale pattern formation in Langmuir-Blodgett films of a semifluorinated alkane and a polystyrene-poly(ethylene oxide) diblock copolymer*, [Nano Letters 2, 1083 \(2002\)](#).

Soft.Matter@PT 2015

Adilson Alves de Freitas

Institution: CQE - IST - University of Lisbon
E-mail: adilsondefreitas@tecnico.ulisboa.pt
Web:
ResearcherID: H-7846-2012
LinkedIn:
ResearchGate:

Expertise: Molecular and excited state dynamics

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental	✓			✓				
Computacional		✓						
Theoretical								

Description of expertise:

- Molecular dynamics simulation.
- Nano-segregation.
- Excited state dynamics.

Selected Publications (max 5):

- *Complex Structure of Ionic Liquids. Molecular Dynamics Studies with Different Cation-Anion Combinations*, [*Journal of Chemical and Engineering Data*, 59, 3120 \(2014\)](#);
- *Improved analysis of excited state proton transfer kinetics by the combination of standard and convolution methods*, [*Photochemical & Photobiological Sciences*, 12, 902 \(2013\)](#);
- *Picosecond Dynamics of Proton Transfer of a 7-Hydroxyflavylium Salt in Aqueous-Organic Solvent Mixtures*, [*Journal of Physical Chemistry A*, 115, 10988 \(2011\)](#);
- *Picosecond Dynamics of the Prototropic Reactions of 7-Hydroxyflavylium Photoacids Anchored at an Anionic Micellar Surface*, [*Journal of Physical Chemistry A*, 114, 4188 \(2010\)](#);
- *Photochemistry of anthocyanins and their biological role in plant tissues*, [*Pure and Applied Chemistry*, 81, 1687 \(2009\)](#).

Soft.Matter@PT 2015

Margarida Telo da Gama

Institution: CFTC - University of Lisbon

E-mail: mmgama@fc.ul.pt

Web: <http://cftc.fc.ul.pt/membro.php?username=margarida>

ResearcherID: A-9476-2010

Scholar: <https://scholar.google.pt/citations?user=OrsjRkYAAAAJ&hl=pt-PT>

Expertise: Interfaces and wetting of simple fluids and liquid crystals

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental								
Computacional	✓	✓	✓	✓				
Theoretical	✓	✓	✓	✓				

Description of expertise:

- Theoretical and Computational.
- Calculation of bulk and interfacial properties (surface tension, contact angle, and wetting properties, adsorbed films) using microscopic (DFT) and mesoscopic (Landau and Landau-de Gennes) theories.
- Numerical calculations (FEM, Lattice Boltzmann) and computer simulations (Monte Carlo and Molecular Dynamics) of equilibrium and non-equilibrium configurations of complex fluids (colloidal suspensions, gels and liquid crystals).

Selected Publications (max 5):

- *The effect of anchoring on nematic flow in channels*, V. M. O. Batista, M. L. Blow and M. M. Telo da Gama, [Soft Matter](#), DOI: [10.1039/C5SM00249D](https://doi.org/10.1039/C5SM00249D) (2015);
- *Adsorbed films of three-patch colloids: Continuous and discontinuous transitions between thick and thin films*, C. S. Dias, N. A. M. Araújo, and M. M. Telo da Gama, [Physical Review E](#) **90**, 032302 (2014);
- *Kinetic roughening of aggregates of patchy colloids with strong and weak bonds*, C. S. Dias, N. A. M. Araújo, and M. M. Telo da Gama, [Europhysics Letters](#) **107**, 56002 (2014);
- *Particle selection through topographic surface patterns in nematic colloids*, Z. Eskandari, N.M. Silvestre, M.M. Telo da Gama, and M.R. Ejtehadi, [Soft Matter](#) **10**, 9681 (2014);
- *Structure of the cholesteric-isotropic interface*, [Soft Matter](#) **10**, 9399 (2014).

Soft.Matter@PT 2015

Maria Helena Godinho

Institution: Faculdade de Ciências e Tecnologia da Universidade Nova de Lisboa
E-mail: mhg@fct.unl.pt
Web: <http://www.cenimat.fct.unl.pt/people/maria-helena-godinho>
ResearcherID: J-3679-2013
ScholarGoogle: <https://scholar.google.pt/citations?user=5NH2NBoAAAAJ&hl=pt-PT>
ResearchGate: https://www.researchgate.net/profile/Maria_Godinho2

Expertise: Interfaces and wetting of simple fluids and liquid crystals

	Colloids	Liquid Crystals	Polymers and Fibers	Interfaces	Foams, emulsions	Granular materials	Cellulose Networks	Other (specify)
Experimental		✓	✓	✓	✓		✓	
Computacional								
Theoretical								

Description of expertise:

- Cellulose liquid crystalline networks and Liquid Crystals.

Selected Publications (max 5):

- Canejo JP, Borges JP, Godinho MH, Brogueira P, Teixeira PIC, Terentjev EM, "Helical Twisting of Electrospun Liquid Crystalline Cellulose Micro- and Nanofibers", [*Advanced Materials*, 20, 4821, 2008;](#)
- Geng Y., Almeida P.L., Fernandes S.N., Cheng C., Palfy-Muhoray P., Godinho M.H., "A cellulose liquid crystal motor: a steam engine of the second kind", [*Scientific Reports*, 3, 1028, 2013;](#)
- Geng Y., Sec D. , Almeida P. L., Lavrentovich O. D., Zumer S., Godinho M.H., "Liquid crystal necklaces: cholesteric drops threaded by thin cellulose fibres", [*Soft Matter*, 9, 7928-7933, 2013. *Soft Matter themed collection Hot paper 2013 \(Cover\)*;](#)
- Trindade AC, Canejo JP, Teixeira PIC, Patrício P, Godinho MH, "First Curl, Then Wrinkle", [*Macromolecular Rapid Communications*, 34, 1618-1622, 2013 \(Cover\)](#);
- Trindade A. C., Canejo J. P., Patricio P., Brogueira P., Teixeira P. I., Godinho M. H., "Hierarchical wrinkling on elastomeric Janus spheres", [*Journal of Material Chemistry*, 22, 22044-2049, 2012.](#)

Soft.Matter@PT 2015

Susana Piçarra Gonçalves

Institution: IPS – Instituto Politécnico de Setúbal and CQFM-IN, Instituto Superior Técnico

E-mail: susana.goncalves@estsetubal.ips.pt

Web:

ResearcherID: E-7261-2015

LinkedIn:

ResearchGate:

Expertise: Polymer and composite materials and nanomaterials

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental	✓		✓	✓	✓			
Computacional								
Theoretical								

Description of expertise:

- Coatings and adhesives.
- Synthesis of nanocomposite materials.
- Synthesis and characterization of polymeric and organic/inorganic hybrid nanoparticles.
- Colloids and interfaces.
- Sol-gel.
- Emulsions.
- Superhydrophobic surfaces.

Selected Publications (max 5):

- *Smart Polymer Nanoparticles for High Performance Water-Borne Coatings*, [Langmuir 30, 12345 \(2014\)](#);
- *The Influence of Nanoparticle Architecture on Latex Film Formation and Healing Properties*, [Journal of Colloid and Interfacial Science, 368, 21 \(2012\)](#);
- *Reactive Aqueous Emulsions for Composite Coatings*, [WO 2014/098637 \(2014\)](#);
- *Interfacial Behavior of Poly(isoprene-*b*-methyl methacrylate) Diblock Copolymers and their Blends with Polystyrene at the Air-Water Interface*, [Langmuir, 23, 9310 \(2007\)](#);
- *Coil-Globule Transition of a Pyrene Labeled Polystyrene in Cyclohexane: Polymer Chain Radii Determination by Fluorescence*, [J. Phys. Chem. B, 108, 12009 \(2004\)](#).

Soft.Matter@PT 2015

Loic Hilliou

Institution: i3N/IPC-Institute for Polymers and Composites

E-mail: loic@dep.uminho.pt

Web: <http://www.i3n.org/Person.aspx?id=130>

ResearcherID: B-5967-2009

LinkedIn: <https://www.linkedin.com/pub/loic-hilliou/22/b78/aa9?trk=pub-pbmap>

ResearchGate: https://www.researchgate.net/profile/Loic_Hilliou

Expertise: Interfaces and wetting of simple fluids and liquid crystals

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Rheo-optics
Experimental	✓	✓	✓					✓
Computacional								
Theoretical			✓					

Description of expertise:

- Rheology, SALS, rheo-NMR.
- Extrusion of polymer blends and composites: structure-properties relationship.
- On-line and in-line monitoring of extrusion based processes.
- Biodegradable plastics.
- Carrageenans: from seaweeds biology to hydrogel properties.
- Bitumen and polymer modified bitumen.

Selected Publications (max 5):

- *Impact of cultivation of *Mastocarpus stellatus* in IMTA on the seaweeds chemistry and hybrid carrageenan properties*, [*Carbohydrate Polymers*, 116, 140 \(2015\)](#);
- *Predicting extrusion instabilities of commercial polyethylene from non-linear rheology measurements*, [*Rheologica Acta*, 53, 817 \(2014\)](#);
- *Hybrid carrageenans: isolation, chemical structure, and gel properties*. [*Advances in Food and Nutrition Research*, 72, 17 \(2014\)](#);
- *A rheo-optical study of stress-fluctuations coupling in a disordered and entangled diblock copolymer solution*, [*Macromolecules*, 41, 3328 \(2008\)](#);
- *Abnormal viscoelastic behavior of side-chain liquid-crystal polymers*, [*Physical Review Letters*, 72, 2109 \(1994\)](#).

Soft.Matter@PT 2015

Catarina R. Leal

Institution: ISEL/IPL – Área Departamental de Física
E-mail: cleal@adf.isel.pt
Web: <http://www2.fisica.isel.pt/catarinaleal.html>
ResearcherID: A-2814-2009
LinkedIn:
ResearchGate: https://www.researchgate.net/profile/Catarina_Leal

Expertise: Soft matter: mechanical properties of complex systems

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental		✓	✓	✓			✓	
Computacional								
Theoretical								

Description of expertise:

- Rheological characterization of complex systems.
- Modeling of viscoelasticity.

Selected Publications (max 5):

- *"Living bacteria rheology: Population growth, aggregation patterns, and collective behavior under different shear flows"*, [Physical Review E 90 \(2014\) 022720](#);
- *"Real-time rheology of actively growing bacteria"*, [Physical Review E 87 \(2013\) 030701\(R\)](#);
- *Electrorheology study of a series of LC cyanobiphenyls: experimental and theoretical treatment*, [Liquid Crystals 39 \(2012\) 25](#);
- *"Reversible Photorheology in Solutions of Cetyltrimethylammonium Bromide, Salicylic Acid and trans-2,4,4'-Trihydroxychalcone"*, [Langmuir 26 \(2010\) 16715](#);
- *"Electrorheological study of the nematic LC 4-n-heptyl-4-cyanobiphenyl: experimental and theoretical treatment"*, [Liquid Crystals 37 \(2010\) 1305](#).

Soft.Matter@PT 2015

José Nuno Canongia Lopes

Institution: CQE - IST - University of Lisbon

E-mail: jnlopes@tecnico.ulisboa.pt

Web: <http://web.ist.utl.pt/jnlopes/zenunoi/Welcome.html>

ResearcherID: H-7166-2012

LinkedIn:

ResearchGate: http://www.researchgate.net/profile/Jose_Nuno_Canongia_Lopes

Expertise: Molecular dynamics

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental								
Computacional		✓		✓				
Theoretical								

Description of expertise:

- Molecular dynamics simulation.
- Nano-segregation in ionic liquids.
- Force field development.

Selected Publications (max 5):

- *Structure and Aggregation in the 1-Alkyl-3-Methylimidazolium Bis(trifluoromethylsulfonyl) imide Ionic Liquid Homologous Series*, [*Journal of Physical Chemistry B*, 118, 567 \(2014\)](#);
- *Surface tension of ionic liquids and ionic liquid solutions*, [*Chemical Society Reviews*, 41, 829 \(2012\)](#);
- *High-performance extraction of alkaloids using aqueous two-phase systems with ionic liquids*, [*Green Chemistry*, 12, 1715 \(2010\)](#);
- *Molecular force field for ionic liquids IV: Trialkylimidazolium and alkoxy carbonyl-imidazolium cations; alkylsulfonate and alkylsulfate anions*, [*Journal of Physical Chemistry B*, 112, 5039 \(2008\)](#);
- *The distillation and volatility of ionic liquids*, [*Nature*, 439, 831 \(2006\)](#).

Soft.Matter@PT 2015

Miguel Machuqueiro

Institution: CQB-FCUL - University of Lisbon
E-mail: machuque@ciencias.ulisboa.pt
Web: <http://webpages.fc.ul.pt/~mamachuqueiro>
ResearcherID: C-8012-2011
LinkedIn: <https://pt.linkedin.com/in/miguelmachuqueiro>
ResearchGate: https://www.researchgate.net/profile/Miguel_Machuqueiro

Expertise: Interfaces and wetting of simple fluids and liquid crystals

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Lipid Bilayers
Experimental								
Computacional							✓	✓
Theoretical							✓	✓

Description of expertise:

- Theoretical/Computational Chemistry and Biochemistry.
- Molecular Mechanics; Quantum Mechanics; Force Field Development; Molecular Dynamics; Continuum Electrostatics; Molecular Docking; Membrane Biophysics.
- The influence of pH and reduction potential in biomolecules; The protonation/conformation coupling in lipids and its influence in the structure of biological membranes.

Selected Publications (max 5):

- *Constant-pH MD of an oleic acid bilayer*, [*J.Chem.Theory Comput.*, 11, 2367 \(2015\)](#);
- *Ionic strength in charged lipid bilayers*, [*J.Chem.Theory Comput.*, 10, 5483 \(2014\)](#);
- *Protonation of DMPC in a bilayer*, [*J. Chem. Theory Comput.*, 10, 2176 \(2014\)](#);
- *Conformational behavior of peptide dendrimers*, [*J.Am Chem.Soc.*, 133, 5042 \(2011\)](#);
- *Constant-pH/redox MD in Cyt.c₃*, [*J. Am. Chem. Soc.*, 131, 12586 \(2009\)](#).

Soft.Matter@PT 2015

Ermelinda M. S. Mações

Institution: IST - University of Lisbon

E-mail: ermelinda.macoas@tecnico.ulisboa.pt

Web: <http://web.ist.utl.pt/ermelinda.macoas/index.htm>

ResearcherID: B-2989-2010

LinkedIn: <https://www.linkedin.com/pub/ermelinda-m-s-macoas/26/558/a0>

ResearchGate: http://www.researchgate.net/profile/Ermelinda_Macoas

Expertise: Interfaces and wetting of simple fluids and liquid crystals

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental			✓	✓				Fluorescent Nanoparticles and organic molecules for imaging
Computacional								
Theoretical								

Description of expertise:

- Steady-state and time-resolved optical spectroscopy.
- Two-photon absorption.
- Confocal and Multiphoton imaging and Fluorescence Lifetime Imaging.

Selected Publications (max 5):

- *New Kind of Hyperbranched Conjugated Polymers Containing Alkyl-Modified 2,4,6-Tris(thiophen-2-yl)-1,3,5-triazine Unit for Enhancing Two-Photon Absorption*, *Macromol.* **2014**. DOI: [10.1021/ma500914v](https://doi.org/10.1021/ma500914v);
- *Molecular architecture effects in two-photon absorption: from octupolar molecules to polymers and hybrid polymer nanoparticles based on 1,3,5-triazine*, *J Mater Chem* **2013**. DOI: [10.1039/c3tb20107d](https://doi.org/10.1039/c3tb20107d);
- *Photoconductive response in organic charge transfer interfaces with high quantum efficiency*, *Nat Commun.*, **2013**. DOI: [10.1038/ncomms2890](https://doi.org/10.1038/ncomms2890);
- *A V-shaped cationic dye for nonlinear optical bioimaging*, *Chem Commun*, **2011** DOI: [10.1039/c1cc12163d](https://doi.org/10.1039/c1cc12163d).

Soft.Matter@PT 2015

Eduardo F. Marques

Institution: CIQ-UP (Centro de Investigação em Química) – University of Porto

E-mail: efmarque@fc.up.pt

Web: <http://orcid.org/0000-0002-3892-9216>

ResearcherID: <http://www.researcherid.com/rid/A-8081-2012>

Scopus Author <http://www.scopus.com/authid/detail.url?authorId=7005196029>

Expertise: Surfactant self-assembly, polymer-surfactant systems, vesicles

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental		✓	✓	✓			✓	
Computacional								
Theoretical								

Description of expertise:

- Experimental studies (phase behavior, microstructure characterization and thermodynamics) with support from computational simulations.
- Characterization of cationic/anionic surfactant mixtures, polymer-surfactant mixtures and gels, and surfactant-carbon nanotube systems.
- Lyotropic and thermotropic liquid crystals from novel surfactants.
- Synthetic vesicles as colloidal vectors for drug and gene delivery.

Selected Publications (max 5):

- *Size, Charge, and Stability of Fully Serine-Based Catanionic Vesicles: Towards Versatile Biocompatible Nanocarriers*, [Chem. Eur. J. 21, 4092 – 4101 \(2015\)](#);
- *Lateral Diffusion of Dispersing Molecules on Nanotubes As Probed by NMR*, [J. Phys. Chem. C 118, 582–589 \(2014\)](#);
- *Morphology, Thermal Behavior, and Stability of Self-Assembled Supramolecular Tubules from Lysine-Based Surfactants*, [J. Phys. Chem. B 117, 9400–9411 \(2013\)](#);
- *Aqueous phase behavior of salt-free catanionic surfactants: the influence of solubility mismatch on spontaneous curvature and balance of forces*, [Soft Matter, 7, 225-236 \(2011\)](#);
- *The effect of cationic gemini surfactants upon lipid membranes. An experimental and molecular dynamics simulation study*, [Phys. Chem. Chem. Phys. 12, 14462–14476 \(2010\)](#).

Soft.Matter@PT 2015

Joaquim Trigo Marquês

Institution: CQB – Faculty of Sciences University of Lisbon

E-mail: jmtm12@gmail.com

Web:

ResearcherID:

LinkedIn:

ResearchGate:

Expertise: Supported lipid bilayers on different substrates – mica, silicon and gold; Lipid-based biosensing interfaces.

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental				✓			✓	
Computacional								
Theoretical								

Description of expertise:

- Development and characterization (by atomic force microscopy, ellipsometry, quartz crystal microbalance, surface plasmon resonance, electrochemistry) of new interfaces based on supported lipid bilayers and their application for the study of biologically relevant molecules or as biosensing platforms.

Selected Publications:

- Marquês, J.T., Viana, A.S., de Almeida, R.F.M. (2014) A Biomimetic Platform to Study the Interactions of Bioelectroactive Molecules with Lipid Nanodomains. [Langmuir \(in press\)](#). DOI: [10.1021/la503086a](https://doi.org/10.1021/la503086a);
- Marquês, J.T., de Almeida, R.F.M., Viana, A.S. (2014) Lipid bilayers supported on bare and modified gold - formation, characterization and relevance of lipid rafts. [Electrochim. Acta 126, 139-150](#). DOI: [10.1016/j.electacta.2013.07.117](https://doi.org/10.1016/j.electacta.2013.07.117);
- Marquês, J.T., de Almeida, R.F.M., Viana, A.S. (2012) Biomimetic membrane rafts stably supported on unmodified gold. [Soft Matter 8:2007-2016](#). DOI: [10.1039/C2SM06738B](https://doi.org/10.1039/C2SM06738B);
- Marquês, J.T., Viana, A.S., and de Almeida, R.F.M. Ethanol effects on binary and ternary supported lipid bilayers with gel/fluid domains and lipid rafts. [Biochim. Biophys. Acta - Biomembr. 1808: 405-414](#). doi:[10.1016/j.bbamem.2010.10.006](https://doi.org/10.1016/j.bbamem.2010.10.006).

Soft.Matter@PT 2015

André Sousa Nunes

Institution: CFTC - University of Lisbon

E-mail: and.sousanunes@gmail.com

Web: <http://cftc.fc.ul.pt/membro.php?username=andren>

ResearcherID:

LinkedIn:

ResearchGate:

Expertise: Interfaces and wetting of simple fluids and liquid crystals

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental								
Computacional	✓							
Theoretical	✓							

Description of expertise:

- Theoretical and Computational.
- Calculation of surface tension, contact angle, and wetting properties using Landau and Landau-de Gennes theory.
- Numerical calculation of configurations of cholesteric liquid crystals.

Selected Publications (max 5):

Soft.Matter@PT 2015

Joaquim Miguel Oliveira

Institution: PT Government Associate Laboratory ICVS/3B's, University of Minho
E-mail: miguel.oliveira@dep.uminho.pt
Web: <http://www.3bs.uminho.pt/users/migueloliveira>
ResearcherID: [H-8636-2012](https://orcid.org/0000-0001-8636-2012)
LinkedIn: <https://pt.linkedin.com/pub/miguel-oliveira/2/56/b79>
ResearchGate: http://www.researchgate.net/profile/Joaquim_Oliveira6

Expertise: Interfaces and wetting of simple fluids and liquid crystals

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental			✓	✓		✓	✓	
Computacional								
Theoretical			✓					

Description of expertise:

- Experimental and Theoretical.
- Tissue Engineering and Regenerative Medicine.
- Hydrogels and Scaffolds.
- Characterization.
- Biomaterials.
- Nanomedicine.
- Stem cells.

Selected Publications (max 5):

- *Figueiras E., Soto A. M., Jesus D., Lehti M., Koivisto J., Parraga J. E., Silva-Correia J., Oliveira J. M., Reis R. L., Kellomäki M., and Hyttinen J., "Optical Projection Tomography as a tool for 3D image tissue engineered products based in hydrogels", [Biomedical Optics Express, vol. 5, issue 10, pp. 3443-3449, doi:10.1364/BOE.5.003443, 2014;](#)*
- *Silva-Correia J., Zavan B., Vindigni V., Silva T. H., Oliveira J. M., Abatangelo G., and Reis R. L., "Biocompatibility Evaluation of Ionic- and Photo-Crosslinked Methacrylated Gellan Gum Hydrogels: In Vitro and In Vivo Study", [Advanced Healthcare Materials, vol. 2, issue 4, pp. 568-575, 2013;](#)*

- *Pereira D. R., Silva-Correia J., Caridade S. G., Oliveira J. T., Sousa R. A., Salgado A. J., Oliveira J. M., Mano J. F., Sousa N., and Reis R. L., "Development of Gellan-Gum based Microparticles/Hydrogel Matrices for Application in the Intervertebral Disc Regeneration", Tissue Engineering Part C: Methods, vol. 17, issue 10, pp. 961-972, 2011;*
- *Mano J. F., Silva G. A., Azevedo H. S., Malafaya P. B., Sousa R. A., Silva S. S., Boesel L. F., Oliveira J. M., Santos T. C., Marques A. P., Neves N. M., and Reis R. L., "Natural origin biodegradable systems in tissue engineering and regenerative medicine: present status and some moving trends", Journal of the Royal Society Interface , vol. 4, issue 17, pp. 999-1030, 2008;*
- *Salgado A. J., Oliveira J. M., Matins A., Teixeira F. G., Silva N. A., Neves N. M., Reis R. L., and Sousa N., "Tissue Engineering and Regenerative Medicine: Past, Present, and Future", Int Rev Neurobiol., vol. 108, pp. 11-33, 2013.*

Soft.Matter@PT 2015

Pedro Patrício

Institution: ISEL/IPL and CEDOC/FCM/UNL

E-mail: pedro.patricio@adf.isel.pt

Web: <https://www.isel.pt/fisica/pedropatricio.html>

ResearcherID: A-2750-2009

LinkedIn:

ResearchGate:

Expertise: Geometrical instabilities in elasticity; Dynamics of complex fluids; Mechanics of Cells

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental								
Computacional	✓	✓		✓				
Theoretical	✓	✓	✓	✓			✓	Rheology

Description of expertise:

- Theoretical and Computational.

Selected Publications (max 5):

- *Living bacteria rheology: Population growth, aggregation patterns, and collective behavior under different shear flows*, P. Patrício, P.L. Almeida, R. Portela, R.G. Sobral, I.R. Grilo, T. Cidade and C.R. Leal, [*Physical Review E* 90, 022720 \(2014\)](#);
- *First curl, then wrinkle*, A. C. Trindade, J. P. Canejo, P. I. C. Teixeira, P. Patrício, and M. H. Godinho, [*Macromol. Rapid Commun.* Vol. 34, 1618–1622 \(2013\)](#);
- *Complex fluids at complex surfaces: simply complicated?*, P. Patrício, J. M. Romero-Enrique, N. M. Silvestre, N. R. Bernardino and M. M. Telo da Gama, [*Mol. Physics*, Vol. 109, 1067 \(2011\)](#);
- *Geometrically-controlled twist transitions in nematic cells*, P. Patrício, M. M. Telo da Gama, and S. Dietrich, [*Phys. Rev. Lett.*, Vol. 88, 245502 \(2002\)](#);
- *Dynamics of singularities in a constrained plate*, A. Boudaoud, P. Patrício, Y. Couder, and M. Ben Amar, [*Nature*, Vol. 407, 718-720 \(2000\)](#).

Soft.Matter@PT 2015

João Pires

Institution: DQB e CQB, Faculdade de Ciências, Universidade de Lisboa
E-mail: jpsilva@fc.ul.pt
Web: <http://webpages.fc.ul.pt/~jpsilva/>
ORCID ID: 0000-0002-8374-558X
ResearcherID: A-4155-2009
ResearchGate: https://www.researchgate.net/profile/Joao_Pires2

Expertise: Interfaces and wetting of simple fluids and liquid crystals

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental			✓		✓	✓		
Computacional						✓		
Theoretical								

Description of expertise:

- Adsorption of gases and vapours.
- Surface modification.
- Surface characterization.
- Sol-gel synthesis.

Selected Publications (max 5):

- [*ACS Applied Materials & Interfaces* 7 \(2015\) 624–637;](#)
- [*Applied Clay Science* 101 \(2014\) 497-502;](#)
- [*Colloids and Surfaces A Physicochem Eng. Aspects* 389 \(2011\) 69– 75;](#)
- [*Journal of Colloid and Interface Science* 344 \(2010\) 603–610;](#)
- [*Journal of Colloid and Interface Science* 317 \(2008\) 206-21;](#)

Other:

Member of the Editorial Board of the Journal of Soft Matter.

Soft.Matter@PT 2015

Maria da Soledade C. S. Santos

Institution: CQB Universidade de Lisboa
E-mail: mssantos@fc.ul.pt
Web: <http://www.ciencias.ulisboa.pt/node/2188>
ResearcherID: A-1952-2009
LinkedIn:
ResearchGate: https://www.researchgate.net/profile/Maria_Santos15

Expertise: Interfaces and wetting of simple fluids and liquid crystals

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental				✓			✓	
Computacional								
Theoretical				✓				

Description of expertise:

- Experimental evaluation of surface and interfacial tension.
- Molecular reasoning of interfacial properties.

Selected Publications (max 5):

- *New Thermodynamics for Evaluating the Surface-phase Enrichment in the Lower Surface Tension Component*, [ChemPhysChem, 15, 2834-2843 \(2014\)](#);
- *Iron (III) Extraction from Chloride Media by N,N'-tetrasubstituted Malonamides: An Interfacial Study*, [J. Colloid Interface Sci. 413, 78–85 \(2014\)](#);
- *Studies on the density, heat capacity, surface tension and infinite dilution diffusion with the ionic liquids [C4mim][NTf2], [C4mim][dca], [C2mim][EtOSO3] and [Aliquat][dca]*, [Fluid Phase Equilibria, 294 \(1-2\), 157-179 \(2010\)](#);
- *Synthesis, surface active properties and antimicrobial activity of new alkyl 2,6-dideoxy-L-arabino-hexopyranosides*, [Carbohydrate Research, 340, 191-201\(2005\)](#);
- *Interactions of selected Flavonoids with NaDS micelles*, [Progress in Colloid and Polymer Sci., 123, 73-77,\(2004\)](#).

Soft.Matter@PT 2015

Benilde Saramago

Institution: IST- University of Lisbon
E-mail: b.saramago@tecnico.ulisboa.pt
Web: <https://fenix.tecnico.ulisboa.pt/homepage/ist11322>
ResearcherID: A-4882-2012
LinkedIn:
ResearchGate:

Expertise: Interfaces and wetting of simple fluids and liquid crystals

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental	✓			✓				Biomaterials, ionic liquids
Computacional								
Theoretical								

Description of expertise:

- Surface tension, contact angle, and adsorption- experimental determination.
- Biomaterials characterization.
- Controlled drug release.
- Biomembrane models.

Selected Publications (max 5):

- *Comparison of two hydrogel formulations for drug release in ophthalmic lenses*, [*J. Biomed. Mater. Res. B.* 102 B, 1170 \(2014\)](#);
- *Effect of Tetracaine on DMPC and DMPC+Cholesterol Biomembrane Models: Liposomes and Monolayers*, [*Colloids Surfaces B: Biointerfaces* 116, 63 \(2014\)](#);
- *Moisture Absorption in Ionic Liquid Films*, [*J. Phys. Chem. C*, 117, 10454 \(2013\)](#);
- *Anesthetics interacting with lipid rafts*, [*Eur. J. Pharm. Sci.* 48, 153 \(2013\)](#);
- *Surface Tension of Ionic Liquids and Ionic Liquid Solutions*. [*Chem. Soc. Rev.*, 41, 829 \(2012\)](#).

Soft.Matter@PT 2015

Karina Shimizu

Institution: CQE - IST - University of Lisbon
E-mail: karina.shimizu@tecnico.ulisboa.pt
Web:
ResearcherID: B-4668-2009
LinkedIn:
ResearchGate:

Expertise: Molecular dynamics

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental								
Computacional		✓		✓				
Theoretical								

Description of expertise:

- Molecular dynamics simulation.
- Nano-segregation in ionic liquids.
- Force field development.

Selected Publications (max 5):

- *Structure and Aggregation in the 1-Alkyl-3-Methylimidazolium Bis(trifluoromethylsulfonyl)imide Ionic Liquid Homologous Series*, [Journal of Physical Chemistry B, 118, 567 \(2014\)](#);
- *On the Formation of a Third, Nanostructured Domain in Ionic Liquids*, [Journal of Physical Chemistry B, 117, 10826 \(2013\)](#);
- *2D or not 2D: Structural and charge ordering at the solid-liquid interface of the 1-(2-hydroxyethyl)-3-methylimidazolium tetrafluoroborate ionic liquid*, [Faraday Discussions, 154, 155 \(2012\)](#);
- *High-Accuracy Vapor Pressure Data of the Extended [C(n)C(1)im][Ntf(2)] Ionic Liquid Series: Trend Changes and Structural Shifts*, [Journal of Physical Chemistry B, 115, 10919 \(2012\)](#);
- *Molecular force field for ionic liquids IV: Trialkylimidazolium and alkoxy-carbonyl-imidazolium cations; alkylsulfonate and alkylsulfate anions*, [Journal of Physical Chemistry B, 112, 5039 \(2008\)](#).

Soft.Matter@PT 2015

Amélia Gonçalves da Silva

Institution: IST- University of Lisbon
E-mail: ameliags@tecnico.ulisboa.pt
Web: <https://fenix.tecnico.ulisboa.pt/homepage/ist11354>
ResearcherID: A-5616-2013
LinkedIn:
ResearchGate:

Expertise: Interfaces and wetting of simple fluids and liquid crystals

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental				✓				Monolayers LB films
Computacional								
Theoretical								

Description of expertise:

- Langmuir Monolayers and Langmuir-Blodgett films.
- Hydrophilic polymers characterization.
- Biomembrane models.

Selected Publications (max 5):

- *Interaction of Toremfene with dipalmitoyl-phosphatidyl-glycerol in monolayers at the air-water interface followed by fluorescence microscopy in Langmuir-Blodgett films*, [Thin Solid Films 2013, 534, 584-590](#);
- *Effect of glucosylceramide on the biophysical properties of fluid membranes*, [BBA - Biomembranes 2013, 1828\(3\) 1122–1130](#);
- *Structure, morphology and interfacial behaviour of ethylene/methacrylate copolymers*, [Journal of Polymer Research 2013, 20\(90\) 1-16](#);
- *Microphase Separation in Mixed Monolayers of DPPG with a Double Hydrophilic Block Copolymer at the Air-Water Interface: A BAM, LSCFM, and AFM Study*, [Langmuir 2010, 26\(22\), 17165–17177](#);
- *Schizophrenic Behavior of a Thermoresponsive Double Hydrophilic Diblock Copolymer at the Air Water Interface*, [Langmuir 2010, 26, 1807-1815](#).

Soft.Matter@PT 2015

Bruno F. B. Silva

Institution: Materials Research Laboratory – University of California Santa Barbara
E-mail: bruno.silva@mrl.ucsb.edu
Web: <http://brunobrasdasilva.wix.com/bruno-silva>
ResearcherID: F-8591-2015
LinkedIn: <https://www.linkedin.com/pub/bruno-silva/b/567/a8>
ResearchGate: https://www.researchgate.net/profile/Bruno_Silva31

Expertise: Interfaces and wetting of simple fluids and liquid crystals

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental	✓	✓	✓	✓	✓		✓	
Computacional								
Theoretical								

Description of expertise:

- Soft Matter; Physical Chemistry; Biomaterials; Biophysics; Nanotechnology; Liquid Crystals; Colloidal Science.
- Small-angle x-ray scattering (SAXS); microfluidics with in-situ SAXS.
- Drug and gene delivery; self-assembly; lipid-DNA nanoparticles; cytoskeletal protein self-assembly; microfluidic methods for nanoparticle structure control.

Selected Publications (max 5):

- *Nematic director reorientation at solid and liquid interfaces under flow: SAXS studies in a microfluidic device*, [Langmuir 31, 4361 \(2015\)](#);
- *PEGylated Cationic Liposome – DNA Complexation in Brine is Pathway-Dependent*, [Biochim. Biophys. Acta – Biomembranes. 1838, 398 \(2014\)](#);
- *Rheochaos and flow instability phenomena in a nonionic lamellar phase*, [Soft Matter 9, 1133 \(2013\)](#);
- *Size, shape, and charge of salt-free catanionic microemulsion droplets: a small-angle neutron scattering and modeling study*, [J. Phys. Chem. B 113, 10230 \(2009\)](#);
- *Unusual vesicle-micelle transitions in a salt-free catanionic surfactant: temperature and concentration effects*, [Langmuir 24, 0746 \(2008\)](#).

Soft.Matter@PT 2015

Nuno M. Silvestre

Institution: CFTC - University of Lisbon

E-mail: nmsilvestre@fc.ul.pt

Web: http://cftc.fc.ul.pt/membro.php?username=nuno_silvestre

ResearcherID: G-5098-2010

LinkedIn:

ResearchGate: https://www.researchgate.net/profile/Nuno_Silvestre

Expertise: Liquid crystals; Liquid crystal colloids; Interfaces of liquid crystals; Confined systems

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental								
Computacional	✓	✓		✓				
Theoretical	✓	✓		✓				

Description of expertise:

- Theoretical and Computational.
- Finite Elements Methods with Adaptive Meshing.
- Lattice Boltzmann Methods.
- Pair-wise interactions of colloidal particles in liquid crystals.
- Colloid-wall interactions in liquid crystals.
- Interfacial phenomena of liquid crystals.
- Confined liquid crystal systems.

Selected Publications (max 5):

- *Particle selection through topographic surface patterns in nematic colloids*, Z. Eskandari, N.M. Silvestre, M.M. Telo da Gama, and M.R. Ejtehadi, [Soft Matter 10, 9681 \(2014\)](#);
- *Towards template-assisted assembly of nematic colloids*, N.M. Silvestre, Q. Liu, B. Senyuk, I.I. Smalyukh, and M. Tasinkevych, [Phys. Rev. Lett. 112, 225501 \(2014\)](#);
- *Liquid crystals boojum-colloids*, M. Tasinkevych, N.M. Silvestre, and M.M. Telo da Gama, [New J. Phys. 14, 073030 \(2012\)](#);
- *Structure of the cholesteric-isotropic interface*, N. R. Bernardino, M. C. F. Pereira, N. M. Silvestre, and M. M. Telo da Gama, [Soft Matter 10, 9399 \(2014\)](#);
- *Nematic wetting and filling of crenellated surfaces*, N.M. Silvestre, Z. Eskandari, P. Patricio, J.M. Romero-Enrique, M.M. Telo da Gama, [Phys. Rev. E 86, 011703 \(2012\)](#).

Soft.Matter@PT 2015

José Maria Tavares

Institution: ADF- ISEL and CFTC - University of Lisbon

E-mail: jmtavares@fc.ul.pt

Web: http://cftc.fc.ul.pt/membro.php?username=jose_tavares

ResearcherID: A-2891-2009

LinkedIn:

ResearchGate: https://www.researchgate.net/profile/Jose_Tavares7

Expertise: Interfaces and wetting of simple fluids and liquid crystals

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental								
Computacional	✓	✓	✓					
Theoretical	✓	✓	✓					

Description of expertise:

- Theoretical and Computational.
- Calculation of structural and thermodynamic properties of complex fluids (with strongly anisotropic interactions and/or with ordered phases).

Selected Publications (max 5):

- "Generalization of Wertheim's theory for the assembly of various types of rings", J.M. Tavares, N.G. Almarza and M.M. Telo da Gama, [Soft Matter](https://doi.org/10.1039/C5SM00559K), DOI: [10.1039/C5SM00559K](https://doi.org/10.1039/C5SM00559K) (2015);
- "Three dimensional patchy lattice model: ring formation and phase separation", J.M. Tavares, N.G. Almarza and M.M. Telo da Gama, [The Journal of Chemical Physics](https://doi.org/10.1063/1.489905) **140** (2014) 044905;
- "Self-Assembly in Chains, Rings, and Branches: A Single Component System with Two Critical Points", L. Rovigatti, J.M. Tavares and F. Sciortino, [Physical Review Letters](https://doi.org/10.1103/PhysRevLett.111.168302) **111** (2013) 168302;
- "Nonmonotonic Magnetic Susceptibility of Dipolar Hard-Spheres at Low Temperature and Density", S. Kantorovich, A. O. Ivanov, L. Rovigatti, J. M. Tavares, and F. Sciortino, [Physical Review Letters](https://doi.org/10.1103/PhysRevLett.110.148306) **110** (2013), 148306;
- "Bicontinuous and mixed gels in binary mixtures of patchy colloidal particles", D. de las Heras, J.M. Tavares and M.M. Telo da Gama, [Soft Matter](https://doi.org/10.1039/C2SM21785A) **8** (2012) 1785.

Soft.Matter@PT 2015

Paulo Teixeira

Institution: ISEL and CFTC - University of Lisbon
E-mail: piteixeira@fc.ul.pt
Web: <http://cftc.cii.fc.ul.pt/membro.php?username=paulo>
ResearcherID: A-2682-2009
LinkedIn: <https://pt.linkedin.com/pub/paulo-ivo-teixeira/6/9b1/9a9>
ResearchGate: https://www.researchgate.net/profile/Paulo_Teixeira4

Expertise: Interfaces and wetting of simple fluids and liquid crystals

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental								
Computational	✓	✓		✓				
Theoretical	✓	✓	✓	✓	✓			

Description of expertise:

- Calculation of phase behaviour of simple fluids using thermodynamic theories.
- Calculation of density profiles and surface tension using density-functional theory.
- Calculation of structure of confined liquid crystals using density-functional theory.
- Calculation of phase behaviour of patchy colloids using Wertheim's theory.
- Calculation of the structure of liquid foams.
- Modelling phase separation in polymer blends and solutions.

Selected Publications (max 5):

- *Reentrant phase diagram of network fluids*, [*Physical Review Letters* 106, 085703 \(2011\)](#);
- *Helical twisting of electrospun cellulose-based micro- and nanofibres*, [*Advanced Materials* 20, 4821 \(2008\)](#);
- *Ordering of hard particles between hard walls*, [*Journal of Physics: Condensed Matter* 13, 4715 \(2001\)](#);
- *The effect of dipolar forces on the structure and thermodynamics of classical fluids*, [*Journal of Physics: Condensed Matter* 12, R434 \(2000\)](#).

Soft.Matter@PT 2015

Smilja Todorovic

Institution: ITQB-UNL

E-mail: smilja@itqb.unl.pt

Web: www.itqb.unl.pt/raman_spectroscopy_of_metalloproteins/

ResearcherID: F-7612-2010

LinkedIn:

ResearchGate: www.researchgate.net/profile/Smilja_Todorovic

Expertise: Interfaces and wetting of simple fluids and liquid crystals

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental				✓			✓	Surface enhanced vibrational spectroscopy
Computacional								
Theoretical								

Description of expertise:

- Surface enhanced (resonance) Raman (SERR) and Infrared absorption (SEIRA) spectroscopy.
- Biocompatible immobilization of proteins and enzymes.
- Bioelectrocatalysis.
- Heterogeneous electron transfer.

Selected Publications (max 5):

- Moe, E., Hildebrandt, P., Sezer, M., Todorovic, S. 2015 'Surface enhanced vibrational spectroscopic evidence for an alternative DNA-independent redox activation of Endonuclease III' [Chem. Comm. 51, 3255-3257](#);
- Silveira, S. M., Quintas, P. O., Moura, I., Moura, J. J. G., Hildebrandt, P., Almeida, M. G., Todorovic, S. 2015 'SERR spectroelectrochemical study of cytochrome cd1 nitrite reductase co-immobilized with physiological redox partner cytochrome c552 on biocompatible metal electrodes', [Plos one-D-15-15477R1 - e64bb5e5426032bf](#);
- Todorovic, S., Hildebrandt, P., Martins, L. O. 2015 'Surface enhanced resonance Raman detection of a catalytic intermediate of DyP-type peroxidase' [Phys. Chem. Chem. Phys. 17, 11954-11957](#);

- Sezer, M., Genebra, T., Mendes, S., Martins, L. O., Todorovic, S. 2012 'A DyP-type peroxidase at a biocompatible interface: structural and mechanistic insights' [*Soft Matter* 8, 10314-10321](#);
- Molinas, M. F., de Candia, A., Szjanman, S., Rodríguez, J. B., Marti, M., Pereira, M., Teixeira, M., Todorovic, S., Murgida, D. 2011 'Electron transfer dynamics of *Rhodothermus marinus* *caa*₃ cytochrome c domain on biomimetic films' [*Phys. Chem. Chem. Phys.* 13, 18088-18089](#).

Soft.Matter@PT 2015

Ana Catarina Rodrigues Trindade

Institution: CENIMAT/ I3N and DCM/FCT/UNL

E-mail: acrt@fct.unl.pt

Web: <http://www.cenimat.fct.unl.pt/people/ana-catarina-rodrigues-trindade>

ResearcherID: I-5393-2013

LinkedIn: <https://pt.linkedin.com/pub/catarina-trindade/22/391/312>

ResearchGate:

Expertise: Interfaces and wetting of simple fluids and liquid crystals

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental	✓	✓	✓					
Computacional								
Theoretical								

Description of expertise:

- Experimental.
- Chemistry, Materials Engineering, Liquid Crystals.
- Elastic Instabilities; Elastomers; liquid crystals; organized structures and janus. membranes/particles/fibres.

Selected Publications (max 5):

- *Wrinkling Labyrinth Patterns on Elastomeric Janus Particles*, [*Macromolecules*, 44, 9399 \(2011\)](#);
- *Hierarchical Wrinkling on elastomeric Janus Spheres*, [*Journal of Materials Chemistry*, 22, 22044 \(2012\)](#);
- *Structural Luminescent elastomeric Janus particles*", [*Macromolecular Journal of Colloid and Interface Science*, 410, 124 \(2013\)](#);
- *First Curl, Then Wrinkle*, [*Macromolecular Rapid Communications* 34, 20, 1589 \(2013\)](#);
- *Longitudinal versus polar wrinkling of core-shell fibers with anisotropic size mismatches*, [*Physical Review E*, 89, 012403 \(2014\)](#).

Soft.Matter@PT 2015

Artur J. M. Valente

Institution: CQC and Department of Chemistry – University of Coimbra

E-mail: avalente@ci.uc.pt

Web: <http://ucdemo.uc.pt/en/staff/avalente/>

ResearcherID: [A-6467-2009](https://orcid.org/0000-0001-9142-1000)

LinkedIn:

ResearchGate: https://www.researchgate.net/profile/Artur_Valente

Expertise:

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental	✓		✓	✓				
Computacional								
Theoretical	✓		✓	✓				

Description of expertise:

- Reactivity in colloidal systems.
- Development of functional gels and polymers.
- Transport phenomena of electrolytes and polyelectrolytes in solution and through polymers.

Selected Publications (max 5):

- *What conjugated polyelectrolytes tell us about aggregation in polyelectrolyte/surfactant systems (Review)*, [Journal of Molecular Liquids. 2015. In press. 10.1016/j.molliq.2015.04.012](#);
- *Plasmid DNA Hydrogels for biomedical applications (Review)*. [Adv. Colloid Interface Sci. 2014;205:257. 10.1016/j.cis.2013.08.002](#);
- *The formation of host-guest complexes between surfactants and cyclodextrins (Review)*. [Adv. Colloid Interface Sci. 2014;205:156. 10.1016/j.molliq.2015.04.012](#);
- *Interpreting the rich behavior of ternary DNA-PEI-Fe(III) complexes*. [Biomacromolecules 2014, 15, 478](#);
- *Effect of Cyclodextrins and pH on the permeation of tetracaine: Supramolecular assemblies and release behavior*. [Int J Pharmaceutics 2014;466:349](#).

Soft.Matter@PT 2015

Ana Célia Vila Verde

Institution: Max Planck Institute of Colloids and Interfaces, Potsdam
E-mail: ana.vilaverde@mpikg.mpg.de
Web: <http://www.mpikg.mpg.de/soft-matter-simulations>
ResearcherID: 0000-0003-0337-3972
LinkedIn: <https://de.linkedin.com/pub/ana-vila-verde/13/a93/275>
ResearchGate: http://www.researchgate.net/profile/Ana_Verde

Expertise: Interfaces and wetting of simple fluids and liquid crystals

	Colloids	Liquid Crystals	Polymers and Gels	Interfaces, surfactants	Foams, emulsions	Granular materials	Biological	Other (specify)
Experimental								
Computacional				✓			✓	
Theoretical								

Description of expertise:

- Computational.
- Classical simulations at the all-atom or coarse-grained level of proteins, lipids, water and aqueous solutions of inorganic ions.
- Classical, all-atom, simulations of aqueous interfaces.

Selected Publications (max 5):

- Cooperative slowdown of water rotation near densely charged ions is intense but short-ranged, [J. Physical Chemistry B \(2013\), vol. 117, 10556](#);
- Statics and dynamics of free and hydrogen-bonded OH groups at the air/water interface, [J. Physical Chemistry B \(2012\), vol. 116, 9467](#);
- Ultrafast reorientation of dangling OH groups at the air-water interface, [Physical Review Letters \(2011\), vol. 107, 116102](#);
- Investigating the specificity of adsorption onto gold of gold-binding peptides using molecular dynamics simulations, [Biomacromolecules \(2009\), vol. 10, 2118](#);
- Simulation study of micelle formation by bile salts, [Soft Matter \(2010\), vol. 6, 3815](#).