



UNIVERSITÀ  
DI TRENTO

Dipartimento di  
Fisica

# XVI International Workshop on COMPLEX SYSTEMS

13-17 March, 2023 - Andalo (Trento)

# PRELIMINARY PROGRAMME

## Monday, 13 March

15.00

### OPENING

Giacomo Baldi, Roberto Menichetti, Raffaello Potestio, and Marco Zanatta

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Chair: Walter Schirmacher

15.10

**Absence of cooperativity near the glass transition**

Matthieu Wyart

15.30

**Probing the structure and relaxation in the “no-man’s land” of phase-change materials**

Shuai Wei

15.50

**Studying dynamics and crystallization in nanometric size vapor-deposited films of molecular glass-former**

Karolina Adrjanowicz

16.10

**Recent results on intrinsic droplet dynamics in emulsions from experiments in microgravity onboard the International Space Station**

Luigi Cristofolini

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16.30 – 17.00

### COFFEE BREAK

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Chair: Luigi Cristofolini

17.00

**Designing enhanced entropy binding in associative polymers**

Lorenzo Rovigatti

17.20

**A soft matter perspective of proteins: From phase behavior to dynamics**

Frank Schreiber

17.40

**Distance-as-time in physical aging**

Jeppe Dyre

18.00

**Data-driven modeling of intrinsically disordered proteins: phase separation and proteome-wide analysis**

Giulio Tesei

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18.20

**KEYNOTE LECTURE**

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Chair: Giancarlo Ruocco

18.30

**To be announced**

Giorgio Parisi

19.15

**End of the session**

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20.00

**DINNER**

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21.00 - 23.00

**POSTER SESSION**

## Tuesday, 14 March

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Chair: Miguel Angel Ramos

8.30

**Theory of non-phononic excitations in disordered systems**

Walter Schirmacher

8.50

**Vibrational properties of particulate physical gels**

Hideyuki Mizuno

9.10

**Hump universality and singularity in low-temperature heat capacity of crystalline and amorphous solids: boson peak or van Hove signature**

Alexander Krivchikov

9.30

**On the microscopic nature of two-level systems in glasses**

Felix-Cosmin Mocanu

9:50

**From the vibrational properties of silicate glasses to the viscosity of their parental melts: a model**

Michele Cassetta

10.05

**The Debye-Waller factor of amorphous glass from static speckle patterns**

Charlotte Petersen

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10.20 - 10.50

COFFEE BREAK

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Chair: Shuai Wei

10.50

**Transverse dynamics in fluids: how a collective excitation sets in**

Ubaldo Bafilo

11.10

**Cooperative dynamics in bulk water**

Margarita Russina

11.30

**Structural relaxation and nano-domain dynamics in highly concentrated electrolytes for zinc anode batteries**

Antonio Faraone

11.50

**Microscopic collective dynamics in liquid neon–deuterium mixtures: neutron scattering and quantum simulations**

Daniele Colognesi

12.05

**Where is the hydrodynamic limit?**

Jesper Schmidt Hansen

12.20

**Supercooled liquid tellurium: Water's distant relative?**

Peihao Sun

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12.35 – 16.00

LUNCH BREAK

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Chair: Hideyuki Mizuno

16.00

**Athermal bond-breaking pathways in glassy chalcogenide materials**

Konstantinos Konstantinou

16.20

**Reversing Peierls-like distortions elicits the polyamorphic transition in GeTe and GeSe**

Tomoki Fujita

16.40

**Pressure-driven disorder in glassy  $As_2Se_3$ : structure, low-energy phonon dynamics and optical band gap**

Giovanna D'Angelo

17.00

**Microscopic origin of resistance fluctuation in germanium telluride glass**

Sebastian Walfort

17.15

**Structural, dynamical and electronic heterogeneities in supercooled-liquid antimony from ab-initio simulations**

Nils Holle

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17.30 – 18.00

COFFEE BREAK

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Chair: Alessandro Paciaroni

18.00

**Untangling the role of tau in neurodegeneration and neurodevelopment using 3D human cortical organoids.**

Silvia Di Angelantonio

18.20

**Self-organization in neural rosette morphogenesis**

Giorgio Gosti

18.35

**Exploring non-equilibrium nanoscale processes in a heated egg yolk using coherent X-rays**

Nimmi Das Anthuparambil

18.50

**Probing cage relaxation in concentrated protein solutions by XPCS**

Yuriy Chushkin

19.10

**End of the session**

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20.00

**DINNER @ MALGA DOSSON**

## Wednesday, 15 March

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Chair: Frank Schreiber

8.30

**Intra-protein interacting collective modes in the terahertz frequency region**

Valeria Conti Nibali

8.50

**Diffusive dynamics of bacterial proteome as a proxy of cell death**

Alessandro Paciaroni

9.10

**Dynamic cluster formation, viscosity and diffusion in monoclonal antibody solutions**

Ilaria Mosca

9.25

**A computational strategy to modulate the compatibility of biomolecular interfaces: the importance in protein design**

Lorenzo Di Rienzo

9.45

**Optimality in self-organized molecular sorting**

Andrea Gamba

10.05

**Transition path sampling with a quantum computer**

Danial Ghamari

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10.20 – 10.50

COFFEE BREAK

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Chair: Jeppe Dyre

10.50

**Excitation populations provide a thermodynamic order parameter for liquids**

Marcus Cicerone

11.10

**The dielectric and rheological responses of strongly asymmetric mixtures of glycerol/propanol**

Jan Gabriel

11.30

**Do structural relaxations in supercooled liquids have the generic line shape?**

Simone Capaccioli

11.50

**The Johari-Goldstein relaxation as probe of the mosaic structure of supercooled liquids**

Federico Caporaletti

12.05

**Reaching the yield point of a glass during X-ray irradiation**

Alessandro Martinelli

12.20

**Amorphous-amorphous transformation induced in glasses by intense X-ray beams**

Erica Alfinelli

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12.35 – 16.00

LUNCH BREAK

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Chair: Margarita Russina

16.00

**Origin of the anomalous properties of water determined using X-ray lasers**

Anders Nilsson

16.20

**Water on the mesoscale and progress towards IXS with 0.3 meV resolution**

Alfred Baron

16.40

**Progress and opportunities for XPCS and XSVS at LCLS**

Paul Fuoss

17.00

**Unique phase transformations in glassy aqueous solutions containing ionic liquids**

Johannes Bachler

17.15

**Deep eutectic solvents: open questions for liquid matter physics**

Denis Morineau

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17.30 – 18.00

COFFEE BREAK

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Chair: Matthieu Wyart

18.00

**Stochastic atomic acceleration during the X-ray-induced fluidization of a silica glass**

Francesco Dallari

18.15

**The ESRF Extremely Brilliant Source for X-ray photon correlation spectroscopy at the beamline ID10**

Federico Zontone

18.35

**Numerical evidence of glass and pseudo-localization transitions in the mode-locked p-spin model for random Lasers**

Jacopo Niedda

18.50

**Multimode fibers: an extremely flexible tool from fast imaging to reservoir computing**

Luca Leuzzi

19.10

**Optical computation of the spin glass dynamics**

Marco Leonetti

19.30

**End of the session**

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20.00

**SOCIAL DINNER**

## Thursday, 16 March

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Chair: Simone Capaccioli

8.30

**Predicting scaling properties from a single configuration**

Thomas B. Schröder

8.50

**Liquid dynamics eases the equilibration of glasses**

Simone Napolitano

9.10

**Long-range concentration fluctuations and their effect on the thermodynamics of model supercooled liquids**

Robin Cortes-Huerto

9.30

**Fluctuation-dissipation relation and effective temperatures in out of equilibrium systems**

Federico Corberi

9.50

**Experimental evidence of a crossover between cooperative relaxation and liquid growth dynamics**

Marta Gonzalez-Silveira

10.05

**The difference of aging near or far from equilibrium**

Florian Pabst

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10.20 - 10.50

COFFEE BREAK

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Chair: Lorenzo Rovigatti

10.50

**Dynamics of passive and activated self assembled patchy particle architectures**

Peter Bolhuis

11.10

**Hydrodynamically-induced morphologies in active and driven matter**

Ignacio Pagonabarraga

11.30

**Towards designing of actively moving nanoparticles: theoretical estimation of optimal geometry and engine parameters**

Irina Nyrkova

11.50

**Colloidal crystals and gels from active apolar colloids**

Pietro Tierno

12:05

**Quantifying the deviation from thermal equilibrium**

Lorenzo Costigliola

12:20

**2D crystals of squares**

Peter Keim

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12.35 – 16.00

**LUNCH BREAK**

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Chair: Alexei Sokolov

16.00

**Suppression of two-level systems with increasing stability in TPD glasses**

Miguel Angel Ramos

16.20

**Low-temperature thermal anomalies in ordered and disordered crystalline phases**

Josep Lluís Tamarit

16.40

**Acoustic attenuation and dispersion in the vicinity of the boson peak**

Marie Foret

17.00

**Electric fields for tuning molecular orientation in TPD-modified glasses: experiments and simulations**

Marta Rodriguez Lopez

17.15

**Effect of secondary interactions on the dynamics of glass forming liquids: insights from the comparison of dielectric and mechanic techniques**

Silvia Arrese-Igor

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17.30 – 18.00

**COFFEE BREAK**

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Chair: Peter Bolhuis

18.00

**Programmable soft matter**

Jasna Brujic

18.20

**NanoDNA sequences in aqueous solutions: structural and thermodynamic results in native and drug-complexed samples**

Lucia Comez

18.40

**Dissecting the role of division noise in promoting cancer phenotypic heterogeneity**

Mattia Miotto

18.55

**Sperm cells in micro-traps: motility sorting and swimming precision**

Claudio Maggi

19.15

**Brillouin light scattering microspectroscopy for biomedical applications**

Daniele Fioretto

19.35

**End of the session**

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20.00

**DINNER**

---

21.00 - 23.00

**POSTER SESSION**

## Friday, 17 March

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Chair: Jasna Brujic

8.30 – 8.50

**Investigation of the mechanism of gellan aggregation at the molecular scale**

Letizia Tavagnacco

8.50 – 9.10

**Static and dynamical properties of modulated hard-spheres fluid**

Michele Caraglio

9.10 – 9.25

**Characterization of interpolyelectrolyte complexes**

Matteo Chamchoum

9.25 – 9.45

**Aggregation of fullerenes C60 in liquids: investigations and theoretical description**

Timur Tropin

9.45 – 10.05

**Superparamagnetic nanoclusters in a strong applied field: understanding static and dynamic magnetic response**

Andrey Kuznetsov

10.05 – 10.20

**Self-assembly and magnetic susceptibility of colloidal magnetic nanoplatelets**

Margaret Rosenberg

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10.20 – 10.50

**COFFEE BREAK**

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Chair: Simone Napolitano

10.50 – 11.10

**Revealing the mechanism of high fragility in polymers**

Alexei Sokolov

11.10 – 11.30

**Chemical vitrification and universal scaling between cooperative motion, caging dynamics, and emergent elasticity**

Silvia Corezzi

11.30 – 11.50

**Evolution of relaxation time and dynamic heterogeneity through aging in metallic glasses**

Eloi Pineda

11.50 – 12.05

**Denser glasses relax faster: a competition between rejuvenation and aging during in-situ high pressure compression at the atomic scale**

Antoine Cornet

12.05 – 12.20

**Exploring the densification effect on dynamics of metallic glass-forming liquid**

Shen Jie

12.20 – 12.35

**Mechanical memory of metallic glasses: time and temperature dependence of the anelastic relaxation**

Mehran Nabahat

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12.35

**CONCLUSIVE REMARKS**

Alexei Sokolov

## Posters

**Dismantling some common beliefs on the Debye relaxation of monoalcohols**

Silvia Arrese-Igor

**Exploitation of the unique capabilities of an ultrafast nanocalorimeter at a synchrotron coherence beamline**

Jacopo Baglioni

**Combining X-ray diffraction and X-ray Raman spectroscopy for the investigation of irradiated shock-compressed silica glass samples**

Lena Bussmann

**Fast differential scanning calorimetry: advancements in data treatment to investigate organic molecular glass-formers**

Simone Capaccioli

**Micro-eV vibrational dynamics in amorphous SiO<sub>2</sub>: evidences of additional modes?**

Federico Caporaletti

**Thermoresponsivity of poly(N-isopropylacrylamide) microgels in water-trehalose solution and its relation to protein behaviour**

Silvia Corezzi

**D4pdf: From constant-wavelength total neutron scattering data to the pair distribution function**

Gabriel Cuello

**Spatial organization of hydrophobic and charged residues affects protein thermal stability and binding affinity**

Fausta Desantis

**Reactive MD simulation of phosphate-based glasses**

Zohreh Fallah

**Vibrational dynamics of ultra-stable and conventional glasses**

Irene Festi

**CANVAS: a fast, accurate, and system-specific variable resolution approach for simulating biomolecules**

Raffaele Fiorentini & Thomas Tarenzi

**Isocompositional liquid-liquid transition at ambient pressure in dilute aqueous LiCl solutions**

Johannes Giebelmann

**Researching the formation of CO<sub>2</sub> structures in cryocondensate thin films**

Oleg Golikov

**Electrostatic complementarity evaluation at the protein interfaces: prediction of transient protein-protein interactions**

Greta Grassmann

**Isochronal superposition of the structure for cumene**

Erik Lørup

**Information-theoretical measures identify accurate low-resolution representations of proteins**

Margherita Mele

**Dynamical and kinetic assessment of nucleic acids systems**

Manuel Micheloni

**The shape complementarity evaluation at the interfaces of protein-protein complexes through a novel strategy based on 2D Zernike formalism**

Edoardo Milanetti

**Magneto-mechanical response of magnetic filaments with solvophobic, super-paramagnetic colloids, in bulk**

Deniz Mostarac

**Investigating the action mechanism of pore-forming toxins with molecular dynamics simulations at different resolution scales**

Costanza Paternoster & Thomas Tarenzi

**Modelling liquid dynamics by random walks within overlapping hyperspheres**

Mark Railton

**Amorphizing or modifying materials by MeV ion irradiation**

Miguel Angel Ramos

**Effect of high pressure on the atomic dynamics of a Au-based metallic glass**

Alberto Ronca

**Spatial resolution of glass relaxation dynamics: a real-time microscopic view**

Marta Ruiz-Ruiz

**Capillary thinning of polymer solution threads: self-similar configurations and instabilities**

Alexander Semenov

**Thermodynamic limit in computer simulations via finite-size integral equations**

Mauricio Sevilla

**Exploring pharmaceuticals with conventional and fast calorimetry**

Daniele Sonaglioni

**Exploring the glassy dynamics of the Gaussian core model**

Vittoria Sposini

**On the characteristic thermal conductivity plateau in model amorphous silica**

Daria Szewczyk

**Pressure Scanning Volumetry: A useful alternative to Scanning Calorimetry**

Elpidio Tombari

**Interaction of ionic surfactants with epoxy-based hydrogel investigated By SANS**

Timur Tropin

**Bio-Inspired topological supramolecular materials: from circular catenanes to kDNA**

Luca Tubiana

**Vibrational phenomena in glasses at low temperatures captured by field theory of disordered harmonic oscillators**

Florian Vogel

**Effect of recondensation on the glass transition of a cryofilm mixture with nitrogen**

Olga Vorobyova

**Measuring the dynamics of complex systems using coherent X-ray radiation at beamline P10**

Fabian Westermeier

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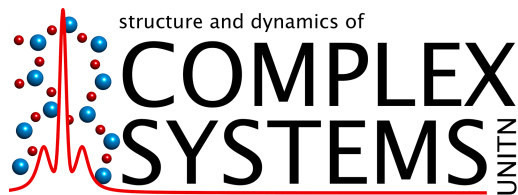
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