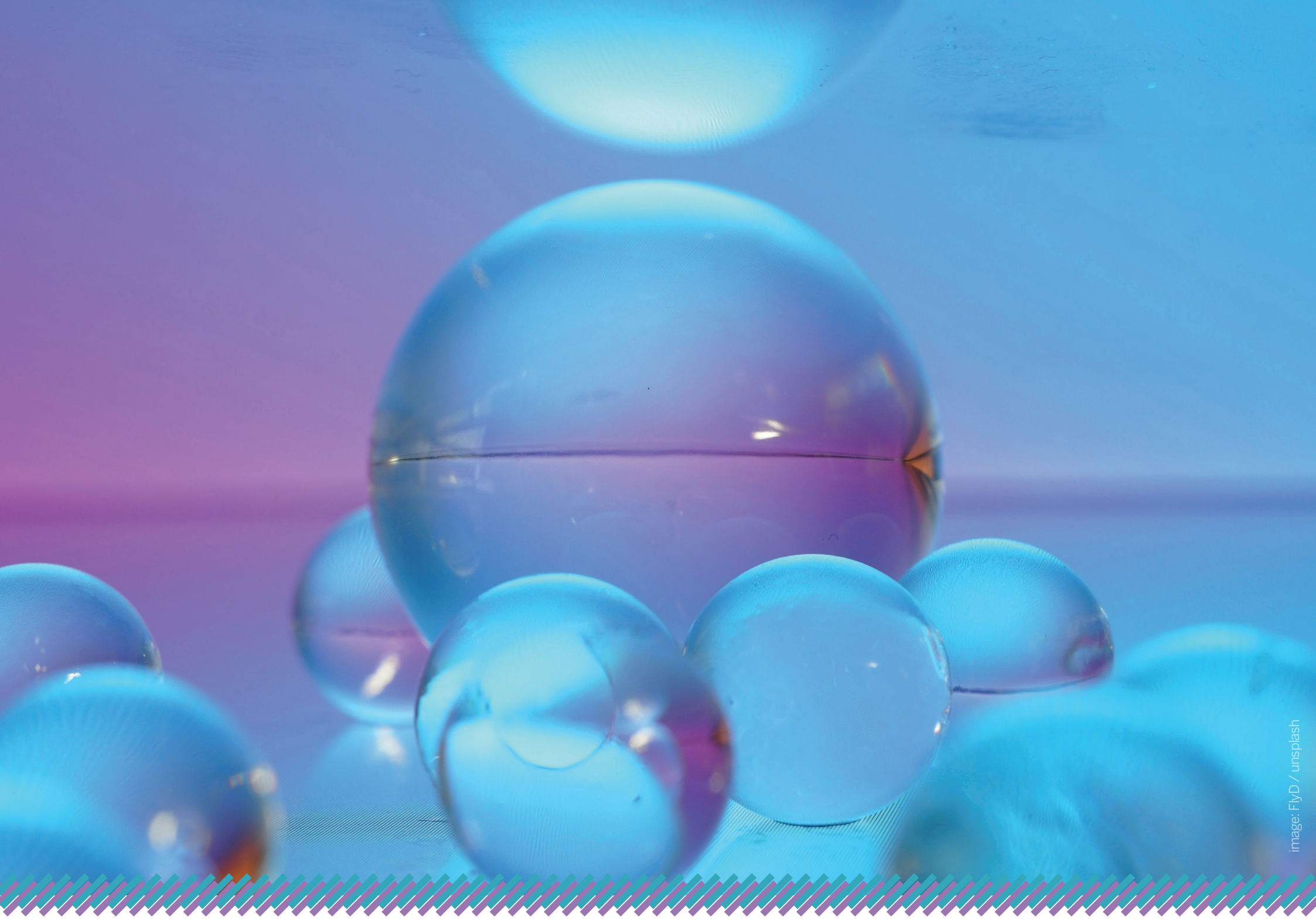

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Ca' Foscari University of Venice
Department of Molecular Sciences and Nanosystems

Department of Environmental Sciences, Informatics and Statistics

Organic chemistry for functional materials: building block synthesis and polymer modification

26 July 2024, h 11.00 am
Conference Room Orio Zanetto, Scientific Campus
Via Torino 155, Mestre (Venice)

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This talk will discuss a number of examples of organic synthesis targeting small molecules to be used as building blocks of functional materials. Specifically:

- Aromatic thioetherketone macrocycles as reactive polymer additives[1]
- Mussel-inspired catecholamines for (i) bio-based poly(ester amide) synthesis2, and (ii) surface modification by dip-coating[3,4]
- Azomethine-bearing diamines as crosslinkers for cleavable epoxy thermoset networks[5]

Moreover, an example of transferring a small-molecule synthetic protocol to a polymer modification reaction will be presented (exchange reaction of PEEK cyclic dithioacetals to cyclic acetals[6]) and the relevant challenges will be discussed.

References

1. Ring-opening polymerization in molten PEEK: transient reduction of melt-viscosity by macrocyclic aromatic thioetherketones. I. Manolakis, P. Cross, S. Ward, H.M. Colquhoun *J. Mat. Chem.* 2012, 22, 20458

2. Novel L-DOPA-Derived Poly(ester amide)s: Monomers, Polymers, and the First L-DOPAFunctionalized Biobased Adhesive Tape. I. Manolakis, B.A.J. Noordover, R. Vendamme, W. Eevers *Macromol. Rapid Commun*. 2013, 35, 71

3. A facile route to bio-inspired supramolecular poly(ethylene glycol) catecholates. A. Shannon, I. Manolakis, *Macromol. Chem. Phys.* 2018, 220(3), 1800412

4. Pentaerythritol-DOPA (PE-DOPA): a tetra-catechol derivative for versatile hydrophilic nanocoatings. U. Azhar, B. Brennan, Y. Lang, D. Tormey, I. Manolakis *Appl. Surf. Sci.* 2024 (under review)

5. Cleavable epoxy networks using azomethine-bearing amine hardeners. A. Chanteli, M. Ó Conaire, R. Brannigan, A. Heise, P. M. Weaver, I. Manolakis *React. Funct. Polym.* 2022, 178C, 105338

6. Exchange reactions of poly(arylene ether ketone) dithioketals with aliphatic diols: formation and deprotection of poly(arylene ether ketal)s. I. Manolakis, P. Cross, H.M. Colquhoun *Macromolecules* 2017, 50, 9561