



## Il Dipartimento di Scienze Chimiche accoglie il dott. Haridas Kar che terrà un seminario dal titolo:

## Self-assembly across multiple length scales

## Giovedì 11 Maggio 2023, ore 16.30 Aula A, Dipartimento di Scienze Chimiche, Via Marzolo, 1.

Self-assembly is considered to be one of the most fascinating approaches to create materials with complex structural and functional properties. Examples range from biological self-assembly such as protein assemblies, cellular condensates, viruses, cell membranes, and their internal structures such as lipid rafts to widely used systems engineering including polymer self-assembly, molecular crystals or bio-inspired approaches to materials engineering. However, synthetic self-assembly and biological self-assembly proceeses are fundamentally different. The synthetic one follows an energetically downhill process, gains in free energy, and is ubiqitous for materials development. In contrast, natural self-assembly processes are energetically uphill, which require continuous consumption of energy to maintain assembly in the functional state.

In this presentation, I will discuss both uphill and downhill self-assembly processes by emphasizing the following themes (i) H-bonding driven supramolecular polymerization of donor-acceptor piconjugated chromophores, mechanistic aspects of self-assembly, and excited state dynamics of self-assembled structures (doctoral research, IACS Kolkata, India); (ii) self-assembly of biopolymers at the air/water interface, fabrication of ultrathin biopolymer films (UW-Madison, USA); (iii) self-assembly of amphiphile-based systems under non-equilibrium conditions, development of macroscopic patterns in a reaction-diffusion system (UNIPD, Italy).

Il Direttore del Dipartimento Michele Maggini