**Titolo: "*Combinatorial methods in topology*"**

**Docente:**

**Prof. Emanuele Delucchi (SUPSI, Svizzera, e Visiting Fellow del Dipartimento di Matematica)**

**Periodo: 2° semestre a.a. 2020-2021 (metà aprile – metà giugno 2021)**

**Durata: n. 30 ore**

L'orario e le modalità delle lezioni verranno concordate con gli interessati in una prima riunione telematica, **martedì 30 marzo alle ore 18:00** (indicheremo qui il link all'aula telematica).

**Descrizione**

The study of topological objects associated to combinatorial structures is a relatively recent but fast developing two-way success story. Topological obstructions have played a major role in the solution of famous combinatorial problems (e.g., the Kneser conjecture) and, conversely, combinatorial techniques (e.g., discrete Morse theory) have led to new results in topology, both of computational and theoretical nature. This lecture takes mainly the second point of view and aims at offering an introduction to some techniques for the study of topological spaces with a strong combinatorial structure. Our main examples will include order complexes of posets as well as subspace arrangements and their complements. A tentative list of the techniques that will be covered includes Quillen-type theorems, shellings, the Nerve Lemma, discrete Morse theory. The syllabus can be adapted to the interests and the background of the participants.