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INTERNATIONAL SOL- GEL SOCIETY IX ISGS Summer School, Alghero, Italy

Instability

From liquid phases to materials
through metastable phenomena

24-26 September 2025



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The IX ISGS Summer School focuses on the intriguing topic of instability in chemical and physical phenomena related to the sol-gel process. This versatile method for creating advanced materials involves kinetics that can lead to metastable chemical physical equilibria. These instabilities significantly affect material properties and performance, impacting processes such as gelation, phase separation, cracking, and phase transitions.

During this summer school, we will examine the physics and chemistry that drive the mechanisms behind these instabilities and their implications for synthesizing various sol-gel materials. Through a combination of lectures and interactive roundtables, participants will gain a deeper understanding of how instability influences the structure and functionality of materials derived from the sol-gel process. The ultimate goal of the school is to bridge theoretical concepts with practical applications, equipping attendees with the tools they need to navigate and control instability in materials obtained through a liquid phase.

List of speakers

- Maria Francesca Casula (University of Cagliari and INSTM)
- Marco Faustini (Sorbonne University)
- Plinio Innocenzi (University of Sassari and INSTM)
- Hiromitsu Kozuka (Kansai University)
- Luca Malfatti (University of Sassari and INSTM)
- Kazuki Nakanishi (Nagoya University)
- Galo J. A. A. Soler-Illia (National University of General San Martin)
- Masahide Takahashi (Osaka Metropolitan University)

Chairmen

Plinio Innocenzi, Luca Malfatti and Davide Carboni

Program

24-26 September 2025

TUESDAY 23/09/2025

19.30 – 21.00 Welcome Aperitivo on the beach

WEDNESDAY 24/09/2025

9.00 – 12.00 Registration
9.00 – 9.30 Opening greetings and Course presentation
9.30 – 11.00 The importance of being unstable (Plinio Innocenzi)
11.00 – 11.15 COFFEE BREAK
11.15 – 12.45 Spinodal decomposition in sol-gel materials (Kazuki Nakanishi)
12.45 – 13.30 LUNCH
13.30 – 15.00 BEACH BREAK
15.00 – 16.30 Stain effects for self-assembly (Luca Malfatti)
16.30 – 16.45 COFFEE BREAK
16.45 – 18.15 Instability of stress, surface morphology and wettability of sol-gel-derived simple oxide thin films (Hiromitsu Kozuka)
18.15 – 19.15 POSTER PRESENTATION

THURSDAY 25/09/2025

9.30 – 11.00 Evaporation-induced Self-Assembly (Galo J. A. A. Soler-Illia)
11.00 – 11.15 COFFEE BREAK
11.15 – 12.45 From a sol to a gel, a kinetically driven transition (Plinio Innocenzi)
12.45 – 13.30 LUNCH
13.30 – 15.00 BEACH BREAK
15.00 – 16.30 From single component to complex aerogels (Maria Francesca Casula)
16.30 – 17.30 Self-assembly at zero gravity (Plinio Innocenzi)
17.30 – 17.45 Early-Career Researcher (ECR) Network (Maria Basso)
20.00 SOCIAL DINNER

FRIDAY 26/09/2025

9.30 – 11.00 Wrinkling in hybrid films (Masahide Takahashi)
11.00 – 11.15 COFFEE BREAK
11.15 – 12.45 Cracking instability (Marco Faustini)
12.45 – 14.00 LUNCH
14.00 – 15.00 Finding stability from instability. Open science discussion (All together)
15.00 – 16.30 Flash presentations from the participants
16.30 – 17.30 Awards and closing remarks