

**Seminar at Politecnico di Torino - May 13, 2026 – Aula Denina, 16:00**

**Abstract**

**Strange Transformations: Nontraditional Techniques for Fabricating Glass**

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Glass is, by nature, a material with an amorphous structure. In its long history, this disordered state has been achieved by slowly cooling specific inorganic precursors—such as silica sand with alkali modifiers. More exotic glass families can be formed under the right conditions, however. In this presentation, we will cover traditional thermodynamic methods (roller and splat quenching, spray cooling), levitation techniques of various kinds, chemical methods, and mechanical/optical strategies for creating disorder in the solid state. Methods used by living organisms (such as sponges and diatoms) will also be discussed. Each laboratory method has unique advantages and disadvantages, and some rely on the presence of impurities or on partial success. The group at Coe College has pioneered some of these approaches, and examples of glasses (*viz.*, pure TeO<sub>2</sub>, high-alkali-content ‘invert’ glasses, aluminates, etc.) that have traditionally been difficult to manufacture will be discussed. Earlier in the talk we will also mention how the historical impact of glass has, in many ways, being undervalued. This provides us with another angle with which we can connect with the general public.

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***Bio sketch***



Prof. Mario Affatigato obtained his undergraduate degree from Coe College in 1989, followed by his Ph.D. from Vanderbilt University in 1995. He has developed a research effort primarily investigating the relationship between the optical properties and structure of glassy materials. He has worked with over 100 undergraduates in projects that include laser-induced modification and exotic manufacturing methods like aerolevitation. His research primarily deals with oxide glasses, especially vanadates, borates, and samples with heavy metals. Prof.

Affatigato is a past recipient of the APS Prize for Research at an Undergraduate Institution, a PECASE award from the National Science Foundation (NSF), a SEED Award from the Research Corporation, as well as other research grants from industry, NSF and the Research Corporation. He is a fellow of the American Ceramic Society and the UK Society of Glass Technology, and a Research Corporation Cottrell Scholar. Currently he holds the Fran Allison and Francis Halpin Professorship at Coe College, is the Editor in Chief of the *International Journal of Applied Glass Science*, and the current President of the American Ceramic Society.