CURRICULUM VITAE

Dario Cavallo

Education and working experiences

Dario Cavallo graduated in Industrial Chemistry (cum Laude) at the University of Genova in 2007. Afterwards he achieved the Ph.D. title in Chemical Sciences from the same University in 2011, under the supervision of Prof. Giovanni C. Alfonso. The title of the Ph.D. dissertation was "Polymer structuring under processing-relevant conditions" and the related research was accomplished also during a visiting period of one year at the Polymer Technology group of the Eindhoven University of Technology (The Netherlands). After the achievement of the Ph.D., he spent five months (March-July 2011) as a post-doc researcher in Madrid (Spain) at the Institute of Polymer Science and Technology (ICTP-CSIC), applying infrared spectroscopy to polymorphic semicrystalline polymers. Subsequently he was employed in another post-doc position at the Eindhoven University of Technology (TU/e), between September 2011 and June 2013, conducting research on structure-properties relationship in semicrystalline polymers for the Dutch Polymer Institute. Since July 2013 he became Assistant Professor of Industrial Chemistry at the Department of Chemistry and Industrial Chemistry of the University of Genoa. Since March 2017 he holds the National Scientific Habilitation from the Italian Ministry of Education, University and Research for the position of Associate Professor in Industrial Chemistry. He then became Associate Professor of Industrial Chemistry in July 2021.

Research interests

The research activity of Dario Cavallo is mainly focused on structuring processes of semicrystalline polymers. Particular attention is paid to polymer solidification in complex external conditions, to the correlation between molecular features and crystallization behavior and to the establishment of structure-properties relationships.
Typical complex conditions are those encountered during polymer processing, where the polymer melt solidifies under the simultaneous application of shear or elongational flow fields and high cooling rates. In particular, he has given relevant contributions to the topic of polymer crystallization under high cooling rates. More recently, this research line has evolved in the study of polymer crystallization during Fused Deposition Modeling (3D- printing). In particular, Dario Cavallo made significant contributions to the understanding of polymer orientation effects on weld strength of 3D printed parts, together with Claire Mcllroy (University of Lincoln).
In collaborations with Gerrit Peters and Leon Govaert (Eindhoven University of Technology), Dario Cavallo has investigated the relationship between the structure of semicrystaline polymers, obtained in different crystallization conditions, and their mechanical performance.
Finally, a recent interest of Dario Cavallo is the effect of heterogeneous surfaces in the primary nucleation step of the crystallization process. This includes nucleation on designed industrial polymer additives (i.e., nucleating agents), nucleation of one polymorph on another structure of the same material (cross-nucleation), as well as nucleation on fiber's surfaces in polymer/fiber composites and at the interface in immiscible polymer blends.

Publications

The results of his research have been published in about **137 scientific publications** since 2008, including articles in the major peer-reviewed international journals of polymer science and 8 invited book chapters. He has actively contributed to international polymer conferences, with more than 70

oral or poster contribution (as main or co-author) since 2008. Among these, he delivered **19 invited lectures** in conferences. He has achieved a total of more than **3297 citations and an *h-index* of 36** (Scopus, June 2024).

Scopus Author ID: 24832907800
ResearcherID: G-6012-2012

Scientific projects

- 2023-2025 : Principal investigator for National Project (PRIN 2022): Zero-defect 3D fused filament fabrication
- 2022-2024: Principal Investigator for the UNIGE project "i-SPOOL – In-situ optical detection of polymer crystallization during 3D printing"
- 2020-2024: Research Unit leader (for the University of Genova) in the MSCA-H2020 ITN-EID project of the European Research Council "REPOL – Characterization, compatibilization, processing and properties of REcycled POLyolefins"
- 2019-2020: Co-applicant for Royal Exchange Scheme (RES) Grant in the project "Flexible vs. stiff polymers for 3D printing: understanding crystallization for enhanced properties", together with Dr. Claire Mcllroy (University of Nottingham)
- 2018-2021: Project leader for "PROFIT – augment the macroscopic PROperties of i-PP composites by controlling the microscopic Fiber-matrix Interactions via Transcrystallization" funded by the Dutch Polymer Institute (DPI 2.0) – Polyolefins Technology area
- 2018-2021: Research Unit leader (for the University of Genova) in the MSCA-H2020 RISE project of the European Research Council "BIODEST – Synthesis, characterization, structure and properties of novel BIODegradable POLyesters"
- 2008-2023: Main or co-proposer of more than 40 research grants for the access to synchrotron facilities at DESY (Germany), ESRF (France), SOLEIL (France)

Editorial activity

The appreciation of his achievements in this research field is testified by the role of **Academic Editor** for the journal "Polymer Crystallization" (Wiley-Hindawi) and by the membership of the International Editorial Board of the "Chinese Journal of Polymer Science" (Elsevier). He also frequent serves as reviewer for major international scientific journals on polymer science, among which *Macromolecules (ACS), Polymer (Elsevier)*, and many others.

Moreover, he has organized four **International Workshops** on "Polymer Crystallization Under Conditions Relevant to Processing" (27-28 May 2010, 21-22 June 2012) and on "Recent advances and new perspectives in polymer crystallization" (29-30 September 2014), "Polymer Crystallization" (3-5 September 2018) held in Genova (Italy) and attended by many academic and industrial researchers.

Teaching and tutoring activity

Since 2014 he teaches the course of "Laboratory of Polymeric Materials" for the Master Degree in Material Science and Engineering. Since 2019 and 2020 he teaches the courses of "Polymers for Additive Manufacturing" and "Polymer Processing"" for the Master Degree in Industrial Chemistry. From 2024 he will teach a part of the course "Polymer manufacturing: from classical processing to 3D printing" for the Master degree in Sustainable polymer and process chemistry. Dario Cavallo has supervised the theses of more than **46 Bachelor and Master students** of

Chemistry, Industrial Chemistry and Material Science. Moreover, he graduated 7 Ph.D.s who did research on semicrystalline polymers and blends.

On-going research collaborations

- Alejandro Muller (POLYMAT / University of the Basque Country, San Sebastian, Spain)
- René Androsch (Martin-Luther University Halle-Wittenberg, Germany)
- Claire Mcllroy (University of Lincoln, UK)
- Stan Looijmans (Eindhoven University of Technology, The Netherlands)
- Guoming Liu (Chinese Academy of Sciences, Beijing, China)
- Luigi Balzano (Kraton, Amsterdam, The Netherlands),
- Davide Tranchida (Borealis Polyolefine, Linz, Austria)