

Raymond S. Farinato

Professor of Professional Practice, Earth and Environmental Engineering

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RESEARCH INTERESTS: SURFACE & COLLOID SCIENCE, POLYMER SCIENCE, PARTICLE TECHNOLOGY, MINES OF THE FUTURE, ENERGY AND RESOURCE EFFICIENCY, WASTE MANAGEMENT, SUSTAINABLE NATURAL RESOURCE DEVELOPMENT, SEPARATION SCIENCE, CIRCULAR ECONOMY

RESEARCH AREAS: MATERIALS, SUSTAINABLE HUMANITY: WATER, SUSTAINABLE HUMANITY: ENERGY, HEALTHY HUMANITY: WATER

Raymond Farinato joined the Earth and Environmental Engineering department as a Professor of Professional Practice in July 2020. He brings a practical sense of how to translate fundamental science and engineering principles into industrial scale technologies. He believes that if technical advances are going to benefit society, then they must be made to work at this scale. Along with other EEE colleagues, Farinato is forming the foundation for a Sustainable Minerals, Metals and Materials (S3M) concentration within the department. Research will be directed at developing the next generation of mineral processing methods from a “mines of the future” perspective. His experience with surface and interfacial science and polymer physical chemistry will be essential in this effort.

Farinato received a BS in chemistry from Rensselaer Polytechnic Institute (1971) and a PhD in Physical Chemistry from the University of Massachusetts–Amherst (1976). He was a post doc in biophysics at the University of California at Berkeley and consulted at the Lawrence Berkeley Labs on radiation damage to DNA. He spent one year as a Senior Engineer at the Nearshore Environment Research Center in Tokyo, Japan before committing the next 39 years to working in industry (American Cyanamid, Cytec Industries, Kemira, Solvay). Over his industrial career he worked predominantly in the areas of water-soluble polymers, surface and colloid chemistry, and adhesion science, with an emphasis on applications in the water treatment, waste management, oilfield, and mineral processing industries. He has published over 90 publications including peer-reviewed articles, patents, and books (2). Farinato is also a founding member of the International Symposia on Polyelectrolytes. From 2005 - 2019 he was an adjunct professor in EEE, co-teaching a graduate level course on Advanced Surface & Colloid Chemistry. His current focus targets the generation and use of the fundamental principles in surface, colloid, and polymer science to underpin the development of scalable technologies applied to earth resources management, including mineral processing, water treatment, waste management in the furtherance of sustainable natural resource development and a circular economy.

Photo:



## RESEARCH EXPERIENCE:

Post-doctoral researcher in Biophysics at U.C. Berkeley

Applied research industrial experience for 39 years developing chemical solutions based on water-soluble polymers and surface-active agents for the waste management, water treatment, oilfield, mineral processing, and composite materials industrial sectors.

## PROFESSIONAL EXPERIENCE:

1979-1980: Coastal engineer at Nearshore Environment Research Center (NERC), Tokyo, Japan

1981-2006: Research scientist → Sr. Research Fellow at American Cyanamid → Cytec industries

2006-2010: Sr. Research Fellow at Kemira

2010-2020: Sr. Research Fellow at Cytec Industries → Solvay

2005-2019: Adjunct Professor at Columbia University (Earth & Environmental Engineering)

## PROFESSIONAL AFFILIATIONS:

- Co-founder and organizing committee member of *International Symposium on Polyelectrolytes* (1993-present)
- American Chemical Society (Colloid & Polymer Divisions); Session organizer for 1991, 1993, 1996, 2003
- Co-chair for 13<sup>th</sup> ICSCS and 83<sup>rd</sup> Colloid and Surface Science Symposium (Columbia University) 2009
- Ion-Containing Polymers Gordon Conferences: 1995, 1997, 1999, 2001 (chair), 2003 (session chair)
- Intertech Conference on Coagulants and Flocculants chairman 2005
- Editorial Boards: *Encyclopedia of Colloid and Surface Science* (current) and *Langmuir* (past)
- Frequent reviewer for: *Minerals Engineering*, *International Journal of Mineral Processing*, *Colloids and Surfaces A*
- American Physical Society (Society of Rheology)
- IACIS (International Association of Colloid and Interface Scientists)
- SME (Society for Mining, Metallurgy and Exploration)
- Sigma Xi
- United States Aikido Federation; member Board of Directors

## HONORS & AWARDS:

NSF NATO ASI Fellowship (1975)

Cytec Industries Circle of Excellence Award (2005)

Solvay Fellow (2016 – 2020)

## SELECTED PUBLICATIONS:

- Nagaraj, D. R., **R. S. Farinato** and E. Arinaitwe (2019) "Flotation Chemicals and Flotation Chemistry". In SME Mineral Processing and Extractive Metallurgy Handbook (Eds: R. C. Dunne, K. S. Kawatra & C. A. Young), Society for Mining, Metallurgy & Exploration, Englewood, Colorado, Ch 7.5, pp. 967-1010
- Tercero, N., D.R. Nagaraj, and **R. Farinato** (2019). "A Critical Overview of Dithiophosphinate and Dithiophosphate Interactions with Base Metal Sulfides and Precious Metals" Mining, Metallurgy & Exploration 36(1): 99-110
- **Raymond S. Farinato** (2014) "Remediating Oilfield Waste and Spills", Chapter 6 in "Oil Spill Remediation: Colloid Chemistry-Based Principles and Solution", Ponisseril Somasundaran, **Raymond Farinato**, Partha Patra, and Kyriakos Papadopoulos, editors
- **Farinato, R.**, M. Hurd, P. Macy and W. P. Watson (2012) Processes for flocculating tailings streams of the oil prospection. WO2012088291A1, Kemira Oyj, Finland
- **Ray S. Farinato**, Joe Calbick, Gina A. Sorci, Fabio H. Florenzano, and Wayne F. Reed (2005), Macromolecules, 38, 1148-1158, "Online Monitoring of the Final, Divergent Growth Phase in the Step-Growth Polymerization of Polyamines"
- H.T. Chen, S.A. Ravishankar, and **R. S. Farinato** (2003) Int. J. Min. Process., 72(1-4), 75-86, "Rational Polymer Design for Solid-Liquid Separations in Mineral Processing Applications"