Marino Xanthos was professor of Chemical, Biological and Pharmaceutical Engineering, associate provost for Graduate Studies and senior technical adviser to the Polymer Processing Institute (PPI) at NJIT until his passing in the summer of 2013. Dr. Xanthos earned a bachelor's degree in chemistry from the Aristotelian University of Thessaloniki and master's and Ph.D. degrees in chemical engineering from the University of Toronto, where he studied under Professor R. T. Woodhams.

After receiving his doctorate in 1974, he joined the research division of Martin Marietta Resources International, where he eventually rose to the position of research, development and technical services manager. From 1980 to 1986, he served as professor and later as director of Stevens Institute of Technology's overseas International Programs Office Department of Polymer Science, Engineering and Technology, jointly operated with the Algerian Petroleum Institute. During the period of 1987 to 1995, he was the research director of the PPI and Stevens Research professor. He was appointed professor of chemical engineering at NJIT in 1995, where he served as director of the Polymer Engineering Center, director of the Center of Processing of Plastics Packaging, chairperson of the Executive Committee of the Materials Research Council, senior technical adviser to the PPI at NJIT, and finally associate provost for Graduate Studies until his passing.

Dr. Xanthos was internationally recognized for his polymer blends, polymer composites and polymer foams expertise, and his studies on polymer modification through the use of functional particulate additives and reactive extrusion processes, which he also applied to the processing of pharmaceutical oral dosage forms. His research work and publications involved Ph.D. and master's students at NJIT and Stevens. He was also involved with PPI technical staff and industrial colleagues nationally and internationally in the solution of numerous important industrial problems.

Dr. Xanthos became a Fellow of the Society of Plastics Engineers in 2003 and received the NJIT Board of Overseers Harlan J. Perlis Award that same year in recognition of his exemplary scholarship and outstanding research in the field of polymers. He served as the U.S. representative to the Board of the Polymer Processing Society since 2005. In 2010, he received the Heinz List Award in recognition of his outstanding achievements in reactive processing and devolatilization.

Dr. Xanthos deeply cared for and was a renowned mentor and adviser to his graduate and undergraduate students. For many years, he was the adviser and life force of the NJIT student chapter of the Society of Plastics Engineers.

This lecture series was established by his family, friends and colleagues to memorialize his accomplishments and love of his chosen field.

Previous Lecturers:

2020: Frank S. Bates, Department of Chemical Engineering and Materials Science, University of Minnesota

2019: Juan de Pablo, Molecular Engineering, University of Chicago

2018: Karen L. Wooley, Departments of Chemistry, Chemical Engineering, and Materials Science & Engineering, Texas A&M University

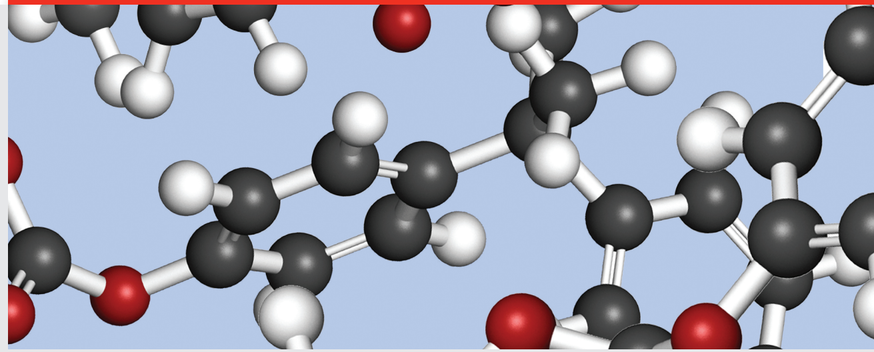
2017: David L. Kaplan, Department of Biomedical Engineering, Tufts University

2016: Thomas P. Russell, University of Massachusetts and Materials Sciences Division, Lawrence Berkeley National Laboratory

2015: Morton M. Denn, Benjamin Levich Institute, City College of New York

One of only 32 polytechnic universities in the United States, New Jersey Institute of Technology (NJIT) prepares students to become leaders in the technology-dependent economy of the 21st century. NJIT's multidisciplinary curriculum and computing-intensive approach to education provide technological proficiency, business acumen and leadership skills. NJIT is rated an R1 research university by the Carnegie Classification®, which indicates the highest level of research activity. NJIT conducts approximately $160 million in research activity each year. It is ranked No.1 nationally by *Forbes* for the upward economic mobility of its students and is among the top 2% of public colleges and universities in return on educational investment, according to PayScale.com. NJIT is also ranked in the Top 100 U.S. universities according to QS World University Rankings® 2021.

NJIT
New Jersey Institute of Technology



Marino Xanthos Memorial Lecture 2021

Jan Vermant
Department of Materials
ETH Zürich

NJIT
New Jersey Institute of Technology

Monday, October 18, 2021

300.8/21

Moshe Kam
Dean
Newark College of Engineering
New Jersey Institute of Technology

on behalf of the
Marino Xanthos Memorial Lecture Committee

requests the honor of your presence
at the

MARINO XANTHOS MEMORIAL LECTURE 2021

Interfacial Rheology: From Beer Foams to Materials Design

Jan Vermant
Department of Materials
ETH Zürich, Zürich, Switzerland

Monday, October 18, 2021, 2:30 p.m.

Central King Building
Room L-70

RSVP to Carolina Yanez by Monday, October 4, 2021
carolina.p.yanez@njit.edu or 973-596-6451.

Abstract

The interfacial region between two fluids (or a fluid and a gas) has peculiar properties. Interface (or surface) tensions are well-known emanations thereof. However, when surface-active material accumulates in these regions, additional properties can emerge, which — when the interface is sharp enough — can be described by surface excess properties, such as surface viscosity or surface moduli. Such properties emerge when lateral interaction between the surface-active moieties is present and it leads to a more complex stress boundary condition with isotropic and extra (deviatoric) contributions. Ideas surrounding these properties have a long-standing scientific history, with Franklin, Plateau and Rayleigh being interested in how the surface stress boundary condition acts. In this work, inspired by differences in the drainage behavior observed in beer foams, between Swiss and Belgian beer, we will start to investigate this question a bit deeper. We will discuss how the relevant material properties of these interfaces can be measured, which is more challenging than the bulk rheological properties due to different aspects, such as the coupling of bulk and interfacial flows or the interplay between compressibility and shear. The interplay between the different effects (capillarity, interfacial rheology and hydrodynamics) can be nicely studied in a dynamic thin film balance (DFTB). The understanding gained from experiments and simulations of the DTFB can be used to design interfaces that are interfacially rheologically active, and used to impart stability in unusual ways.

Jan Vermant

Jan Vermant studied chemical engineering at KU Leuven in Belgium, obtaining a doctoral degree in 1996 under the supervision of Professor Jan Mewis. He then was a postdoctoral fellow of Elf Aquitaine and the Fund for Scientific Research–Vlaanderen, which had him working at Stanford University with Professor Gerry Fuller, at CNRS labs in Sophia Antipolis (CEMEF) and Bordeaux (CRPP), at the University of Delaware with Professor Norm Wagner and at KU Leuven in Belgium with Professors Mewis and Paula Moldenaers. In 2000, he joined the faculty in the Department of Chemical Engineering at KU Leuven, becoming a full professor in 2005. In 2014, he joined the Department of Materials at the ETH Zürich, where he now heads the Laboratory of Soft Materials and is professor of soft materials. He served as head of the department from 2020-2021 and is a member of the universitywide Research Commission.

Professor Vermant has held visiting appointments at Stanford University, University of Delaware, Princeton University, the Forschungszentrum Jülich and the ESPCI. Major awards include a Dupont Young Faculty Award, the FWO-ExxonMobil European Chemical Science & Engineering Award, the *Journal of Rheology* Publication Award (twice), the Onsager Professorship and Onsager Medal, and the 2021 ECIS-Solvay Colloid and Interface Prize. He is the recipient of the 2019 Weissenberg Award of the European Society of Rheology and the 2021 Bingham Medal of the U.S. Society of Rheology. He is a Fellow of both the Royal Society of Chemistry and the Society of Rheology. He was editor of *Rheologica Acta* for 10 years, from 2010-2020.

His research at the ETH Zürch focuses on the transport phenomena and rheology and applications of complex fluid-fluid interfaces, with the development of new measurement techniques and methods of analysis being at the core of research. In the area of bulk rheological systems colloidal suspensions, emphasis is on relating shear-induced microstructures with rheological properties. The development of superposition rheometry has created a new approach to studying microstructure during nonlinear flows. Novel processing methods have been designed, with the understanding of the microstructural phenomena helping to make these energy efficient or able to, for example, print materials with higher resolution.