

**Memorial Resolution in Remembrance of Professor Fortunato (Nato) J. Micale**  
**Lehigh University Senate Meeting, December, 6, 2024**



It is my honor to write this resolution in remembrance of my good friend Nato Micale. I knew Nato for 23 out of his 30 years of service to Lehigh as a Professor of Chemistry. He was a wonderful colleague, easy to work with, humble, low-key, smart, caring, generous, and always had a positive attitude and a sense of humor.

Nato Micale, was born in 1932 & passed away this year (2024). He is survived by his wife Rita, 3 daughters and 9 grandchildren. His daughter Linda Howley was a Lehigh graduate (1990).

Nato earned a B.A. in 1956 from (St. Bonaventure University), a B.S. in 1959 from (Niagara University), a M.S. in 1961 from (Purdue University) and a Ph.D. in 1965 from (Lehigh University), with Dr. Albert Zettlemoyer his advisor. He joined the Department of Chemistry as a faculty member in 1966 until he retired in 1995. He taught courses in Physical Chemistry, Surface and Colloid Science. He conducted his research activities with affiliation to two of Lehigh Research Institutes, namely, The National Printing Ink Research Institute (NAPIRI, 1965 -1990), and the Emulsion Polymers Institute (EPI) (1973-1995). Both institutes were sponsored and funded by numerous industrial companies. Throughout Nato's career he collaborated with many faculty members internally and externally, as well as industrial scientists. He mentored a good number of PhD's and MS graduate students. His research results were disseminated via conference presentations, reviewed publications, and chapters in edited books. Nato invited undergraduate students to conducted research projects in his laboratory under his guidance during the academic year and the summer.

At NAPIRI, his research focused on surface and colloid chemistry relating to rheology and wettability of dispersed systems which was of interest to the Printing Ink industry. These include electrophoretic mobility of fine particle-particle interactions in aqueous and nonaqueous systems, ink transfer as a function of wetting and complex rheology and kinetics of dynamic wetting for thin films of water-based systems on polymer films.

At the EPI, Nato advised a number of graduate students working on projects related to emulsion polymerization and latex systems. The outcomes of their research were recorded in the Semi-Annual Research Reports and distributed to EPI Industrial members. On an annual basis, the graduate students displayed their posters at the EPI annual review meeting and discussed progress in their projects with the Industrial representatives and faculty members.

Nato was an active member of Lehigh's team of 3 professors and 4 students who successfully carried out successive seeded emulsion polymerizations under microgravity conditions on five NASA space shuttles - Columbia and Challenger (1981-1984). The results were producing monodisperse polystyrenes (PS) particles with sizes of 5 – 40 microns. The 10-micron PS particles were certified by the National Bureau of Standards and sold as a primary standard material. In 1984, the LU team of 3 professors included Nato, and a NASA

scientist, were named “Inventors of the Year” by NASA for developing a process in which tiny latex microspheres were made on space shuttle flights, and considered as the 1<sup>st</sup> man-made product in space.

Nato was also a member of two teams that conducted & published results from 2 experiments in near-to-zero gravity: 1<sup>st</sup> in 1972 on Apollo 16 (free-fluid particle electrophoresis), and 2<sup>nd</sup> in 1986 on the 7<sup>th</sup> space shuttle (latex particle separations by continuous flow electrophoresis).

Nato filed jointly 10 patents. Four (4) joint patents by the Lehigh team of 3 professors & a NASA scientist for making monodisperse latex particles in the space shuttles, and six (6) joint patents with 4 industrial companies dealing with colored pigments and UV sunblock compositions.

Among the external professional activities, Nato was a member of the American Chemical Society, and served as Secretary of the Division of Colloid & Surface Chemistry (1977-1978). He also served on the Nuclear Regulatory Committee (NRC) on Protective Clothing. He was a reliable consultant to a number of companies, such as Koh-I-Noor for colored pigments.

**Some memories from his family and students** (provided by his daughter Linda Howley).

Nato’s family was the most important thing to him. He was a devoted husband and father. But he particularly loved being a grandfather. Whether he was dancing with his grandchildren, playing UNO with them, making paper airplanes with them, teaching them how to make neutrally buoyant balloons; he was always there with the family. He loved to tell funny stories and make people laugh. He may have told the same dozen jokes year after year, but somehow, they were still funny. He loved a good discount, loved being a chemist, and loved being an amateur photographer.

Nato was equally devoted to his graduate students and they have good memories of him. One of his PhD students (Ken J. Chiang -1983) wrote: “He was not only an exceptional scholar but also a compassionate mentor. His dedication to his students went beyond the classroom, as he always made time to listen, encourage, and inspire. His impact on my research and personal growth cannot be overstated”. “He introduced me to the American Beef at a Steak House in Allentown and insisted I eat one-pound size Prime rib, I protested saying my stomach was small to finish it. 40 years later, I have grown to love American Prime ribs and could finish the one-pound size without any leftover”.

**A final memory** – When I arrived to Lehigh in 1972 as a Postdoctoral fellow, Nato was the first person who warmly welcomed me to Sinclair Lab. He was ready to help me with any and everything I might need to settle in Bethlehem. In a short period of time we bonded and our family friendship continued well past his retirement from Lehigh. Nato will always be in our memories. May God Bless his Soul.

Respectfully submitted by

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