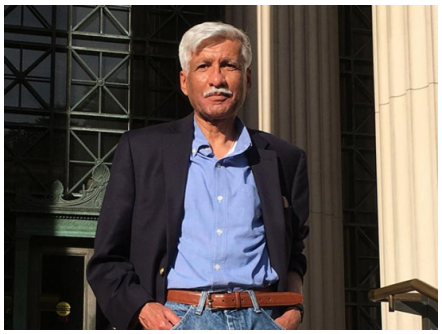
Manoj Choudhary, a legend in the glass industry

Posted: December 12, 2019



Manoj Choudhary is no stranger to the spotlight. His legacy in the glass and ceramics worlds glows with transformative achievements, countless keynote addresses, and prestigious honors recognized globally. Dr. Choudhary is a staple at Ohio State by serving as an adjunct professor and guest lecturer in MSE classes. The Department of Materials Science and Engineering celebrated Manoj in June after he won the International Congress on Glass (ICG) President's Award, which is presented to the individual who has made "outstanding

lifetime contributions to the international glass community in areas such as scientific discoveries, engineering developments, artistic accomplishments, leadership, and communications".[1] Four months later, Choudhary added another notable accomplishment by being invited to deliver the Atma Ram Memorial Lecture at the Central Glass and Ceramic Research Institute (CGCRI) in Kolkata, India. CGCRI is a national research institute under the Council of Scientific and Industrial Research (CSIR) in India. His lecture was titled, "Materials Innovation through Modeling and Simulation".

Manoj Choudhury, Atma Ram Memorial Lecturer October 15, 2019 | Kolkata, India

"This is the most prestigious lecture given at the Institute. Dr. Atma Ram was the founding Director of CGCRI and made pioneering contributions in developing Optical Glass technology in India. He later became the Director General of CSIR. The 15 previous Atma Ram Memorial Lecturers were among the Who's Who of India's scientific and technical community. I delivered the 16th Atma Ram Memorial Lecture on October 15.", shares Dr. Manoj Choudhary.

In light of the recent updates about Manoj and his presence in the classroom this autumn, we are sharing a first-person account of his journey, including a passion for Ohio State and unbridled learning.

New country, additional degrees, and glass

After completing my undergraduate study in India in 1974, I came to SUNY Buffalo for my M.S. and then attended MIT where I earned my doctorate in Materials Science and Engineering. My doctoral and post-doctoral research was in the area of electromagnetic processing of materials, specifically involving the investigation of electromagnetic, fluid flow, and heat transfer phenomena in such processes. It typically involved mathematical modeling of these phenomena in conjunction with measurements in manufacturing plants and laboratories. I went into glass because I saw a high potential to apply my knowledge and skills to the modeling and simulation of electric melting of glasses specifically but glass melting and processing in general. In those days (early 1980s), modeling in the glass industry was in its early stages and lagged behind modeling of metallurgic processes. More broadly, I went into glass (and also polymers and minerals) for the same reason that I went from chemical engineering to materials. I am intellectually curious and have a strong desire to learn new things. I also am relatively good at identifying opportunities for synergies.

Guest lecturer in Ceramic Processing 5551

Professor Sheikh Akbar wanted students in 5551 to be introduced to glass and kindly invited me to give a guest lecture in 2018. I developed materials for an introductory lecture that would provide an overall background on glass to students. I prepared this lecture by borrowing elements from several separate lectures I give on a broad range of topics in glass science and technology. I also incorporated elements of several

presentations I have given on ubiquity of glass, its role as a transforming material in advancing civilization, history of man-made glass, and the importance of glass in areas such as communication, healthcare, architecture, and sustainable development. Sheikh liked the content, the students enjoyed the lecture, and many things about glass were learned. I updated and repeated the lecture in autumn 2019 and shared samples of raw materials used in glass manufacturing.

I hope there will be more opportunities to be a guest lecturer at Ohio State. One of the distinct features of my 40-year career has been that, although I worked primarily in industry, all my major projects involved collaboration with universities. The defining aspect of my professional work has been applications of scientific and engineering fundamentals to manufacturing processes and products. Students can benefit greatly by connecting lessons in classrooms and laboratories with industry.

Education then and now

The delivery.

I began my undergraduate study half a century ago and completed my doctorate almost four decades ago. A lot has changed during this time. For example, how we receive, process, and transmit information has changed enormously since I was an undergraduate student. This has obviously changed the way the content is delivered. There was no PC, no email, and no Microsoft Office when I was a student. Even fax machines became common after I had completed my post-doctoral

work. During my undergraduate years in India, being able to copy a document was a rare luxury. The way content is delivered today has changed dramatically.

The content.

Education– especially technical education, has to incorporate knowledge and practices as they develop to remain relevant. While fundamentals and basic concepts remain the same, how we apply them in practice changes, and the curriculum needs to reflect this. One of the most significant changes in engineering education since my undergraduate years has been the emergence and evolution of materials science and engineering from its roots in metallurgy and solid state physics. During my undergraduate years, there were very few separate materials science and engineering departments. Now, they are common place. This is rightly so because materials constitute the building blocks of our economy, society, and culture. The materials science and engineering curriculum includes foundational subjects such as thermodynamics, kinetics, and fracture mechanics, but it also evolves to include topics that are relevant to meet needs in areas such as automotive, aerospace, computers, energy generation and storage, communication, and medicine. In the context of my lecture, for example, I illustrated the use of advanced simulation for glass process optimization and innovation. There have been and continue to be enormous advances in hardware and software that have made it possible to apply and integrate modeling and simulation for the design, operation, and control of manufacturing processes.

The engagement.

I need to point out that my undergraduate education was in India. When I came to the US for graduate school some 45 years ago, I encountered significant changes in student engagement and the setting– related to cultural (e.g. student-teacher relationship) and material (e.g. physical facilities, educational resources) differences between India and the US. Student engagement depends on the motivation of the students, the instructor, and the learning environment. The mode of communication used now has impacted the engagement significantly. There was much more personal interaction between the student and the instructor and among the students when I was a student.

Adjunct Professor

Those of us living in Central Ohio are blessed to have a great university like Ohio State in our neighborhood. I have always had multi-faceted interactions with Ohio State, especially with folks in MSE and CBE and am very pleased to have the adjunct professorship with DMSE.

At this stage in my career and life, the most meaningful impact I can make is through teaching, guiding, and mentoring. I enjoy these activities immensely and hope to have more opportunities for such activities.

Visiting

I visit the Columbus campus about six times a year, which is much less than when my son was a student here.

Atma Ram Memorial Lecture - October 15, 2019

My lecture was on Materials Innovation through Modeling and Simulation. Computational techniques and tools are playing increasingly important roles in the discovery, design, development, and application of new materials, as well as in manufacturing of more well-known materials such as metals, glasses, and polymers. Material scientists and engineers have access to a great variety of simulation techniques and tools spanning a wide range of temporal and spatial scales. These allow us to investigate atomic/molecular scale phenomena at one end of the spectrum to the design and operation of large engineering scale units on the other end. Computational materials science and engineering is an area of active educational and research focus in many materials science and engineering departments all over the world, including at Ohio State. So the theme of my lecture is very much related to an area of current and active interest in materials science and engineering.

ICG President's Award - June 2019

The International Commission on Glass (ICG), founded in 1933, is the preeminent organization of the global community of glass scientists and technologists and the President’s Award is ICG’s highest award. The award recognizes outstanding lifetime contributions to glass science and technology, and leadership in promoting the interests of the international glass community. I am deeply grateful to ICG and its president, Professor Alicia

Duran, for this great honor. 40 years ago, I decided to make a career in the field of glass science and technology. At that point in my career I knew very little about the field. I felt there were prospects for applying what I had learned in chemical engineering, materials science, and process metallurgy to the manufacture and processing of glass. I was very fortunate to find mentors who helped and guided me. I am grateful to them and to colleagues and collaborators all over the world for enabling me to receive this recognition.

A day in the life of Manoj

I enjoy reading, especially essays and short stories but also travelogues and poems and writings on history and current affairs. In addition, I enjoy listening to songs from Hindi cinema (Bollywood) of 1950s and 1960s, cinema and theater but wish I had more time to indulge in them. And I am active physically through yoga, walking, biking.

My wife and I have a daughter and a son. Unfortunately, no one in my immediate family shares my passion for materials! We do get along fine, however, because of our shared passion for cuisine and movies.

[1] International Commission on Glass. http://www.icglass.org/home/awards/. Accessed June 21, 2019.

Tags: AWARDS FACULTY