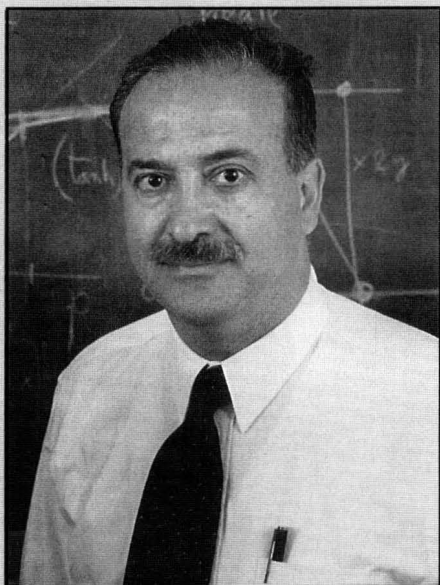


EDUARDO D. GLANDT

of the University of Pennsylvania



While Eduardo is widely regarded for his lucid and stimulating lectures, it is the “pair-wise interactions” with him that students cherish most. His door is always open, and one rarely passes by without seeing him tutoring an undergraduate or working closely with a graduate student.

KYLE VANDERLICK

University of Pennsylvania • Philadelphia, PA 19104

The timing was perfect. It was 1993 and the Chemical Engineering Department at Penn was turning the corner on one hundred years. The person who most deserved the honor of blowing out the birthday candles was none other than its chairman: Eduardo Glandt. The setting was also perfect. This son of a pharmacist would host the birthday bash in Philadelphia, where its chemical industry emerged in large part from apothecaries that were called upon to manufacture explosives during the revolutionary war.

Penn was supposed to have been just a pit stop on the road to overhauling chemical engineering education in Argentina. It all began with Eduardo's own training at the University of Buenos Aires in his hometown. Enrolled in a rigorous six-year chemical engineering program, he and a schoolmate, Hugo Caram (now teaching at Lehigh University), were in the first class to use Bird, Stewart, and Lightfoot's text for transport phenomena. Of all his educational experiences, Eduardo remarks that his encounter with BSL had the most profound impact on his life.

After completing his Bachelor's degree in 1968, Eduardo spent the next five years working at the National Institute of Industrial Technology (the national lab of Argentina). The structure of the job was akin to that of a technical doctor, serving as problem solver/consultant to the inorganic and minerals industries of Argentina. During the evenings, however, Eduardo returned to the University of Buenos Aires to teach chemical engineering courses—including transport phenomena, of course.

At the University, Eduardo was joined by other young adjunct professors, including his younger brother Carlos (also a chemical engineer) and Hugo Caram. These three, along with computer scientist Luis Trabb, formed a notorious “gang of four,” secretly advancing engineering education in the twilight hours while the old guard was off duty. They taught the fundamental courses at an unprecedented high level, and with their left hands they developed from scratch a simulation package to design chemical processes. They felt they needed more training and credentials to carry their mission forward, and so they decided to obtain doctorates from the best schools in the US and then return to Buenos Aires. Hugo went to Minnesota, Carlos to Princeton, Luis to Stanford, and Eduardo came to Penn. Unfortunately for their native country—but fortunately for the US—their grand plan was ruined by the turmoil in Argentina in the late seventies.

It was Eduardo's first research project that earned him a faculty posi-

tion at Penn, but not his PhD. Working with Alan Myers, Eduardo developed a systematic method for Second-Law analysis of sets of reactions. He then used it to investigate the feasibility of producing hydrogen from water by chemical means. The answer prevented the project from going beyond a Master's thesis, but the originality of the work led to an invitation to speak at the departmental seminar series. Eduardo's presentation convinced the department, chaired by Dan Perlmutter at the time, to end its ongoing search for an assistant professor; the faculty met the next day and enthusiastically agreed to offer Eduardo the position.

Eduardo began teaching on the first semester of his third year, while still working on his PhD research. In 1977, a short year and a half later, he completed his dissertation on molecular theories of adsorption, jointly advised by Alan Myers and Donald Fitts (from Chemistry). The thesis was the first application of modern liquid theory to interfacial phases, and it earned Eduardo the American Chemical Society Victor K. LaMer Award. That same year, he also received the S. Reid Warren Award for Distinguished Teaching, the only teaching award presented within Penn's School of Engineering and Applied Science.

The next decade would see the making of a distinguished career in both research and teaching, marked by Eduardo's promotion to associate professor in 1981 and to full professor in 1985. His academic maturation took place in an environment where young faculty had a large say. John Quinn, who was chairman of chemical engineering at Penn from 1980 to 1985, tapped into the energy and ideas of his junior colleagues: Liz Dussan, Eduardo, Doug Lauffenburger, and Ray Gorte. The collegiality and mutual support of these people is a subject of local legend.

In 1990, Eduardo was named as the Carl V.S. Patterson Professor of Chemical Engineering, the second incumbent after Stuart Churchill. In 1995, he was the inaugural recipient of the Russell Pearce and Elizabeth Crimian Heuer Chair in Chemical Engineering. His teaching has been honored with the coveted Lindback Award, the highest teaching award presented across the University, and this year his many research accomplishments were recognized by his election into the National Academy of Engineering.

Eduardo's research work in statistical thermodynamics appears to be diverse, but it is actually driven by one underlying theme: recognizing that seemingly different phenomena are—at some level—one and the same. He has shown how molecular-level knowledge of the structure of liquids can be used to describe the behavior of systems characterized by macroscopic length scales such as colloidal suspensions, packed beds, and other disordered systems. He has been a pioneer at building bridges from liquid state theory to quantitative analysis of phenomena such as gelation, percolation, and effective transport properties of random media. He has skillfully and elegantly used a wide arsenal of tools in his work,

Winter 1997



Above: Eduardo and Ben Franklin at centennial celebration with recipients of the University of Pennsylvania Medal for Distinguished Achievement: left to right, Stuart W. Churchill, Neal R. Amundson, Ben, Arthur E. Humphrey and Eduardo.

Below: Eduardo is shown presenting Ben Franklin with the honorary degree of "Ornamental Chemical Engineer." Franklin, the first Chemical Engineer at Penn, believed that youth should be educated in those things that are "most useful and most ornamental."



including molecular simulation and other methodologies native to statistical mechanics.

Eduardo is quick to point out that the analogy between molecular and macroscopic disorder is only skin deep. The disorder in a packed bed is static, frozen in place. The need to overcome this inherent difference led Eduardo and his collaborator Bill Madden (now on the chemical engineering faculty at Wayne State University) to develop a formal treatment for systems in which some degrees of freedom are quenched. This integral-equation treatment allowed them to describe phase equilibrium in porous materials by treating the system as a binary mixture composed of adsorbent and

adsorbate. Their approach has by now been used as a platform for molecular theories of adsorption, capillarity, liquid-liquid equilibrium, and protein and polymer partitioning in random substrates.

Most recently, Eduardo has returned to his collaboration with Alan Myers on the topic of gas adsorption. Using molecular simulations, they have addressed the important problem of structure-capacity relations and of surface modification of adsorbents. The possibility of natural gas storage by adsorption for vehicular applications gave much currency and even urgency to this research.

Never failing to make connections between different phenomena, Eduardo has even applied theories of irreversible adsorption to one of his favorite pastimes: crossword puzzles. One could also argue that theories of irreversible adsorption apply to the process of advisor selection; in Eduardo's case, the model would require very large attractive forces. Always one of our students' top choices, Eduardo has advised 22 graduate students, with many entering academia (including Yi Chiew at Rutgers, Julio Briano at Puerto Rico, Nigel Seaton at Cambridge, Dave Kofke at Buffalo, and most recently, Dave Ford at Texas A&M). His group has always been a rather spirited one. They have come to be known as the Glandt Ensemble (a pun on the Grand Ensemble of statistical mechanics). A later group, less inclined to the classical music image, also constituted itself as a punk rock group called the Swollen Glandts (see photo).

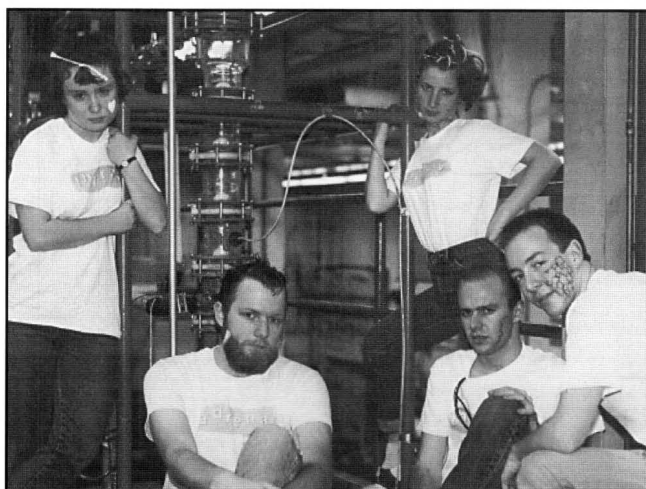
While Eduardo is widely regarded for his lucid and stimulating lectures, it is the "pair-wise interactions" with him that students cherish most. His door is always open, and one rarely passes by without seeing him tutoring an undergraduate or working closely with a graduate student. His dedication is nowhere more apparent than in the way he launches new graduate students; they each receive a personal course in statistical thermodynamics. Between student consultations, it is the other faculty who call upon him to check their own understanding or to sound out their ideas.

When scientific inquiry is not the order of business, everyone always counts on Eduardo for advice on travel and culture. A true citizen of the world, he can recommend the best restaurants in every major city across the globe, the hottest theater tickets in both New York and London, and the most provocative book to hit the stands. Although his literary interests are boundless, readings on the philosophy or history of science are sure to be tucked into his briefcase. A connoisseur of both haute and popular culture, one is equally likely to catch him reading the Collected Works of Gibbs or the Collected Works of Dilbert.

One of Eduardo's favorite plays is "Six Degrees of Separation," which makes the point that a person is only a few acquaintances away from knowing just about anybody else. One can safely say that the shortest distance between any two people within the chemical engineering profession prob-



A group of Glandt's students known as "The Glandt Ensemble."



Student punk rock group, "The Swollen Glandts."

ably follows a path through Eduardo. His connection to many in and out of the profession stems from his genuine and passionate interest in people.

Eduardo holds the honor of having taught every course in Penn's chemical engineering curriculum and has held every administrative post, including Chairman, from 1991-1994. Records would also easily verify that he has sat on more thesis committees than any other faculty member in the history of the department. His leadership extends well beyond departmental boundaries; his wisdom and insight are in demand across the School of Engineering and Applied Science. Then, there are also countless intangibles, such as his authorship of our alumni newsletter, the *Distillates*, since its creation.

With nothing but the Red and Blue blood of Penn flowing through every vein in his body, we all count on Eduardo as the veritable heart and soul of our department to guide us well into the next hundred years. □