

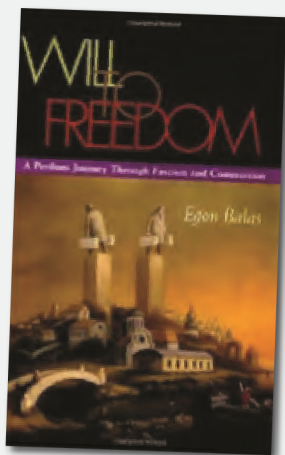
Spring 2015 Spencer Schantz Lecture Series



Dr. Egon Balas

Industrial and Systems Engineering Spring 2015 Distinguished Lecturer

University Professor of Industrial Administration and Applied Mathematics
Thomas Lord Professor of Operations Research



Dr. Egon Balas is not your average mathematician. In fact, when Dr. Balas gave his public lecture at Lehigh University in April, the over packed auditorium was comprised not only of mathematics and engineering students, but history students as well.

Dr. Balas didn't begin his career in the mathematics field until he was 37 years old. "As a high school student, I loved math and physics. I would have become a mathematician or a physicist in the regular way if the war didn't interrupt that."

When World War II broke out, Hitler ran down most of Europe in a few weeks and imposed his odious regime everywhere. Balas, clearly against this, joined the Hungarian Communist Party, and recruited others in attempts to organize resistance. Dodging danger, Egon went into hiding in October 1943. He was later arrested and spent several weeks under interrogation with torture. After Russians took his hometown of Cluj, his captors became uninterested and he was sentenced and sent to jail. This unfortunately would not be Egon's last time in prison.

Egon later met Edith, a survivor of Auschwitz and Bergen-Belsen. After she returned to Cluj, the two were married and had a daughter. Egon, at this time, was a promising young diplomat working in Foreign Affairs. It wasn't until 1952 when Egon had fallen from favor with Romania's Communist regime, that he was arrested yet again.

"I was interrogated without interruption for four weeks," explains Egon. "All they wanted from me was a false confession. I was told there were only two ways out; by execution or a jail sentence." Egon was held captive, in his 8x14 foot cell, for two years and three months. Reading was prohibited along with writing, speaking and exercising. "The only time you could sleep was from 10:00 p.m. to 5:00 a.m. and on most nights that would be the time for interrogation." Egon says he spent his time, when not under interrogation, repeating everything he had ever learned and trying to remember novels he had read. "In the evening, I went to the opera" – meaning he tried to recall opera performances he had attended.

After Joseph Stalin's death, Egon was set free. Upon his arrival home, he found that he now had not only one daughter, but two. Edith found out nine days after Egon was taken away that she was with child.



For several years after his release Egon worked as an economic researcher, but upon writing a book about Keynesian economics he was expelled from the research institute and forbidden to work as an economist. He then returned to his first love, mathematics, and trained himself to become an operations researcher. He solved several practical production and distribution problems and in the mid-sixties he wrote a pioneering paper on implicit enumeration, which later became a Citation Classic as the most frequently cited paper of the journal *Operations Research* (between 1954 and 1982). In 1966, he managed to emigrate with his family and in the following year joined Carnegie Mellon University in Pittsburgh. In the 70's, he developed a theory for optimization over unions of polyhedra, known as disjunctive programming, which has formed the basis of numerous subsequent developments in cutting plane theory for integer and combinatorial optimization. In particular, the lift-and-project approach developed in the 90's by Balas and his coworkers has played a crucial role in triggering the revolution in the state of the art in Integer Programming that occurred during the following decade. Balas also contributed theory and algorithms for various combinatorial optimization problems, like set packing and covering, traveling salesman and its generalizations, knapsack, three dimensional assignment, vertex separator, etc. On the practical side, he has developed various scheduling algorithms and software.

Dr. Balas has taught a variety of courses at different levels, and has acted as thesis advisor to 31 doctoral students. Balas has honorary doctorates in Mathematics from the University of Elche, Spain (2002), the University of Waterloo, Canada (2005), and the University of Liege, Belgium (2008). He has published over 230 articles and studies and he wrote the memoir *Will to Freedom: a Perilous Journey through Fascism and Communism*. Syracuse University Press, 2000 (paperback, 2008), describing his life before migrating to the US.

Balas has spent the last 48 years at Carnegie Mellon University. Although still very active with his research and teaching, Balas also enjoys spending time with his family: besides his wife Edith, he has two daughters, three grandsons and two great-grandsons.

