

## Biography of Charles F. Zukoski

Zukoski received his undergraduate degree in Physics from Reed College in 1977 and his Ph.D. in Chemical Engineering from Princeton University in 1985 after which he joined the faculty at the University of Illinois-Urbana Champaign, Illinois. Zukoski's research program has been continuously funded since 1985 and investigates suspension mechanics, protein crystallization and nanoparticle self-assembly. Results of this program are recorded in greater than 150 research publications and have been recognized through numerous awards. He was named one of the Hundred Chemical Engineers of the Modern Era by the American Institute of Chemical Engineers and is a member of the National Academy of Engineering.

Zukoski's 17 year administrative career has focused on building research and education programs of distinction in the US and abroad. The central unifying themes of his work are originality of concept and quality of execution.

As the Head of the Department of Chemical Engineering at Illinois from 1994 to 2002, Zukoski led the effort to change the Department's name from Chemical Engineering to Chemical and Biomolecular Engineering and, in the process, established Illinois as the catalyst for a global renaming process that solidified biomolecular engineering as a core component of the Chemical Engineering discipline.

During this time period, recognizing the need of the academy to embrace a responsibility to educate the public about the role of engineers in sustaining our quality of life Zukoski worked with department faculty members to create a tenure track, non-research position in Chemical and Biomolecular Engineering for Professor William Hammack who has since established himself as The Engineering Guy on NPR and now on social media websites.

While Department Head, Zukoski sustained a strong alumni outreach program which had a significant development function resulting in endowments for a Post-Doctoral Fellowship, a Professorship and two Chairs. Early in his tenure as Department Head, Zukoski recognized the need to broaden attractiveness of chemical engineering to underrepresented groups and built an externally funded minority outreach program that included establishing a branch of the National Organization of Black Chemists and Chemical Engineers at Illinois.

The benefits of globalization of education and research were realized early in Zukoski's career. As Department Head he built a joint master's program with the National University of Singapore funded by the Singapore government and industry that paired students from Illinois and Singapore and included course work and internships in both the US and Singapore. This effort later blossomed into the University of Illinois' first joint PhD program with the National University of Singapore.

From 2002 to 2008, Zukoski was Vice Chancellor for Research, VCR, at Illinois where he focused on enhancing the impact of the scholarship and research across the University through the development of multidisciplinary efforts, and in enabling the campus to accelerate the commercialization of innovative research.

As VCR, Zukoski oversaw the establishment of three multidisciplinary research institutes: the Institute of Genomic Biology, the Institute of Advanced Computing and Technology, and the Institute of Natural Resources Sustainability (now the Prairie Research Institute). In addition, Zukoski enabled the establishment and funding of the Illinois Center for Computing in Humanities, Arts, and Social Sciences (I-CHASS). Each of these institutes is known for the quality of research undertaken and the bold approach to multidisciplinary research they embody.

Zukoski played leadership roles in the building of the Energy Biosciences Institute- a \$500M- 10 year collaboration between the University of California-Berkeley, the Lawrence Berkeley National Laboratory, Illinois and BP and in successfully landing NCSA's Bluewaters Petascale High Performance Computing Initiative funded by the National Science Foundation. As VCR, Zukoski sat on the Science Policy Committee of Argonne National Laboratory.

Continuing efforts to expand education and research collaborations abroad, as VCR Zukoski established the Office of International Research and through that office built strong links between Illinois and Singapore, China, and Cyprus.

During his tenure as VCR, Zukoski had primary responsibility for implementing sweeping changes to campus technology commercialization activities. Zukoski established the Office of Technology Management which oversees intellectual property protection and licensing for the campus, was on the founding Board of Illinois Ventures, a public/private venture capital organization aimed at commercializing Illinois technologies, had primary responsibility for substantial growth of the Research Park at the University of Illinois and established EnterpriseWorks, the campus incubator. As part of an effort to ensure a welcoming community for campus technology commercialization activities, Zukoski was a member of the executive committee of the Champaign County Economic Development Corporation. During his time as VCR, by working with different faculty groups, commercialization of technology went from being viewed skeptically to being embraced to the extent that debates were started in numerous departments on the role of patents and participation in start-up companies as part of tenure and promotion decisions.

From 2006-2012, Zukoski was the Chairman of the Science and Engineering Research Council, SERC, of the Agency for Science, Technology and Research, A\*STAR. After stepping down from his position as VCR, from 2008 to 2011, Zukoski had a partial leave of absence from Illinois and spent three quarters of his time in Singapore as A\*STAR underwent a major 5 year planning exercise. In this role Zukoski had responsibility for setting directions for SERC's 7 research institutes.

The research institutes of SERC have a total budget of ~\$500M/yr and play a significant role in implementation of Singapore's economic development strategies. In his position as Chair, Zukoski worked to ensure that SERC remains a pivotal player in attracting, retaining and growing technology sensitive industries in Singapore. A major strategic element developed and implemented as part of the planning exercise involved creating the ability of SERC to deliver integrated, multidisciplinary research partnerships. Key tactics to accomplish this strategy include incentivizing high quality, goal oriented research, and creating structures that enable building teams that can work at scale to deliver solutions requiring multiple disciplines.

Zukoski is currently the Elio Eliakim Tarika Endowed Chair of Chemical and Biomolecular Engineering at the University of Illinois and a Senior A\*STAR Fellow.

**CHARLES F. ZUKOSKI**  
**Elio Eliakim Tarika Chair of Chemical and Biomolecular Engineering**  
**University of Illinois Urbana-Champaign**

**PROFESSIONAL PREPARATION**

B.A. Physics, Reed College (1977)

Ph.D. Chemical Engineering, Princeton University (1985)

**PROFESSIONAL APPOINTMENTS**

<i>University of Illinois at Urbana-Champaign</i>	Vice Chancellor for Research (2002-2009) Head of Chemical Engineering (1995-2002) Interim Head of Chemical Engineering (1994-1995) Professor of Chemical and Biomolecular Engineering (1994-present) Beckman Institute Professor (1994-1998) Beckman Institute Associate Professor (1990-1994) Associate Professor of Chemical Engineering (1990-1994) Assistant Professor of Chemical Engineering (1985-1990)
<i>Agency for Science Technology and Research, Singapore</i>	Chairman, Science and Engineering Research Council (2005-2011)
<i>University of Melbourne</i>	Visiting Professor of Applied Maths (1992)
<i>Princeton University</i>	Graduate Research Assistant (1979-1985)
<i>University of Oregon</i>	Research Assistant, Health Sciences Center (1977-1979)

**AWARDS (selected)**

- One of the Hundred Engineers of the Modern Era, American Institute of Chemical Engineers 2008
- National Academy of Engineering 2007
- Alpha Chi Sigma Award for Chemical Engineering Research, AIChE (2002)
- Ralph K. Iler Award for the Chemistry of Colloidal Materials, American Chemical Society (1997)
- Publication Award, Society of Rheology (1997)
- Moulton Medal, Institute of Chemical Engineers (1997)
- University Scholar (1994-1997)
- Fulbright Teaching/Scholars Award, University of Melbourne (1992)
- NSF Presidential Young Investigator Award (1987)

**SELECTION OF RECENT PUBLICATIONS**

S.Y. Kim, K.S. Schweizer and C.F. Zukoski, "Multiscale Structure, Interfacial Cohesion, Adsorbed

Layers and Thermodynamics in Dense Polymer-Nanocomposite Mixtures" *Phys. Rev. Lett.* 107(22)

Article number 225504(2011)

S.Y. Kim, C.F. Zukoski, “ Role of Polymer Segment Surface Interactions in Controlling nanoparticle Dispersions in Concentrated Polymer Solutions” *Langmuir* 27(17) 10455-10463(2011)

R.C. Kramb and C.F. Zukoski “Nonlinear Rheology and Yielding in Dense Suspensions of Hard Anisotropic Colloids” *J. Rheol* 55(5) 1069-1084(2011)

R.C. Kramb, C.F. Zukoski, “Exploration of the Volume Fraction Above Which Suspensions of Spherical And Weakly Anisotropic Colloid Particles Cannot Flow” *J. Rheol* 55(5) 1085-1101(2011)

R.J. Larsen and C.F. Zukoski “Effect of particle Size on Glass transition” *Phys Rev E* 83(5) Article Number 051504(2011)

S.Y. Kim and C.F. Zukoski “Particle Restabilization in Silica/PEG/Ethanol Suspensions: How Strongly Do Polymers Need To Adsorb To Stabilize Against Aggregation?” *Langmuir* 27(9) 5211-5221(2011)

R.J. Larsen and C.F. Zukoski, “Molecular Mixture as an Effective Single-Component System” *J Phys Chem B* 115(14)3981-3991(2011)

R.C. Kramb, R. Zhang, K.S. Schweizer and C.F. Zukoski, “Re-entrant Arrest and Elasticity of Concentrated Suspensions of Spherical And Nonspherical Repulsive And Attractive Colloids”, *J. Chem Phys* 134(1) Article Number: 014503(2011)