Anna C. Balazs, Ph.D. —

a pioneer in the area of predicting the behavior of complex polymeric materials through her theoretical predictions, has been named 2013 Mines Medalist by the South Dakota School of Mines & Technology.

Balazs, Ph.D., is Distinguished Professor of Chemical Engineering at the University of Pittsburgh, whose area of expertise is theoretical and computational modeling of polymer blends and composites. She is recognized as a trend-setting researcher who developed powerful, comprehensive computer models to predict the behavior of nanocomposites. These studies provided critically needed guidelines for creating high performance materials formed from
polymers and nanoparticles.

She becomes the fifth Mines Medalist to be named by the South Dakota School of Mines & Technology, which founded the national award in 2009 to recognize scientists and engineers who have demonstrated exceptional leadership and innovation.

Dr. Balazs’ research has significant impact on the scientific world. She leads a team that predicted the behavior of Belousov-Zhabotinsky (BZ) gels, a gel with far-reaching applications “such as artificial skin that could be sensory – a holy grail in robotics,” she has said.

“The research being conducted by Anna Balazs has the power to transform lives, and we are excited to name such a distinguished researcher as our 2013 Mines Medalist,” said School of Mines Acting President Duane Hrncir, Ph.D.

Her group developed the first computational model to describe large scale deformations and shape changes in chemo-responsive polymer gels. She has also made significant contributions to the area of self-healing materials and has collaborated with experimentalists at the McGowan Institute for Regenerative Medicine at the University of Pittsburgh.

The materials and modeling methods being produced as a result of her work are far-reaching, with her research focusing on a very diverse spectrum of systems, including nanocomposites, self-oscillating gels, self-healing materials and polymeric microcapsules.

Dr. Balazs’ work focuses on developing theoretical and computational models to capture the behavior of polymer blends, nanocomposites, complex fluids and colloidal systems, work that is “crucial to develop predictive models for the behavior” of designing advanced materials, according to one of her nominators Steven R. Little, Ph.D., chair of the Department of Chemical and Petroleum Engineering at the University of Pittsburgh.

“It is in this area that Balazs and her research group have made fundamentally important and unique contributions, which are allowing scientists to understand how choices made at the molecular level affect the macroscopic performance of the system.” Little described her work as both “theoretically elegant and applicable to real materials of industrial relevance.”

She has been a fellow in the Royal Society of Chemistry; a senior visiting fellow at Oxford Center for Advanced Materials and Composites and Materials Science Department (Oxford University); visiting fellow at Corpus Christi College, Oxford University; and a fellow with the American Physical Society.

Her work has been published in Science, Nature and numerous other publications and has been described in popular media outlets such as The Economist and Science News.

She will be presented the next Mines Medal during the Oct. 3, 2013, Mines Medal Dinner and Award Ceremony to be held at the Rushmore Plaza Civic Center.

Dr. Balazs says she feels “extremely honored to be inducted into a group that includes such
illustrious awardees.”

Previous Medalists include Dr. Diana Wall, 2012 recipient and University Distinguished Professor and director of the School of Global Environmental Sustainability at Colorado State University; Dr. Lee Rybeck Lynd, 2011 recipient and professor of engineering and adjunct professor of biology and earth science at Dartmouth College; Steven Squyres, 2010 recipient and Cornell University astronomer and principal scientist for NASA’s Mars Exploration Rover missions; and Dr. Cindy Van Dover, 2009 recipient and chair and professor of Duke University’s Division of Marine Sciences and Conservation and director of the Duke University Marine Laboratory.