

Editorial

Special Issue on Biological Systems
Dedicated to William S. Klug



We dedicate this special issue to William Scott Klug. On June 1, 2016, at the age of 39, Bill was the victim of a campus shooting at the University of California, Los Angeles. We will forever remember Bill as a deeply committed and clever scientist, as a kind, caring and dedicated mentor, and as an outstanding friend.

Bill received his B.S. degree in Engineering Physics from Westmont College in Santa Barbara where he met his future wife Mary Elise Richter. In 1999, both graduated with master's degrees in Civil Engineering from the University of California, Los Angeles and soon got married. Encouraged by Mary Elise, Bill began his Ph.D. research at the California Institute of Technology in Pasadena. Many of us first met Bill in 2005, when he presented his Ph.D. research on a director-field theory of DNA packing in bacteriophage viruses at the 8th U.S. National Congress on Computational Mechanics in Austin. It was a forerunner of the presentations that Bill would become known for: sharp, precise, and to the point.

Bill graduated from CalTech under the supervision of Michael Ortiz in 2003. In the same year, he accepted a faculty position as Assistant Professor in the Department of Mechanical and Aerospace Engineering at the University of California, Los Angeles. He was promoted to Associate Professor in 2009 and to Full Professor in 2015. Born

in Torrance southwest of Los Angeles, Bill was a Southern California kid at heart, and embraced the laid-back Southern Californian lifestyle. He joked that even Northern California was too uptight for him! He enjoyed living in El Segundo close to the beach and surfing early in the morning before heading off to lecture. He was known to bring his surfboard to conferences and rise before dawn to catch an early wave before the first talk. Bill was always excited about everything he did: whether he was teaching variational principles, driving his new sports car, a Subaru WRX, or carefully choosing a new vinyl album to add to his collection. Bill had a strong Christian faith and he was a loving and devoted husband and father of two. He always talked passionately about his family and immersed himself in his kids' worlds: from coaching their baseball teams and teaching them to skateboard, to watching with them as planes took off and landed at nearby Los Angeles International Airport. Bill's wife and children also shared his passion for computer programming and decided that the first family computer would run the Linux operating system.

Our scientific community will remember Bill for his seminal contributions to DNA packing and his insight into virus capsids using the Caspar–Klug theory, which – as Bill used to joke – was unfortunately not named after him. By explaining how viruses inject DNA into cells, his work has the potential to help fight numerous viral diseases. In 2008, Bill received the NSF CAREER award for his research on membrane–protein interactions and the mechanics of cell organelles. As part of this work, he developed finite element models of lipid bilayer membranes. Bill's research is featured in 56 journal publications in high impact factor journals including *Nature Communications*, the *Proceedings of the National Academy of Sciences*, and *Physical Review Letters*.

More recently, Bill helped us understand and model the electromechanics of the human heart. In his distinguishing rigor, he proved the convergence of different algorithms and discretization schemes, thereby shaping the way for the community to adopt the most efficient simulation techniques. He was a leading member of the UCLA Cardiac Modeling Group with the ultimate goal of reducing the incidence of heart disease and improving human health. This special issue contains Bill's last publication on viscoactive constitutive modeling of myocardium using variational updates. Bill had started to write this work together with his student Aditya Ponnaluri, his postdoctoral researcher Luigi Perotti and his close clinical collaborator Daniel Ennis at UCLA, who jointly finalized the manuscript on his behalf.

Bill commanded tremendous scientific respect. He was an inspirational role model to his students and colleagues and a good friend to many of us. He had numerous collaborators and close friends at UCLA, across California, in the United States, and around the world. As an exceptionally talented midcareer scientist, he played a central role within the United States Association for Computational Mechanics, where he was an active member of the Biological Systems Technical Thrust Area. In this function, he successfully co-organized the first USACM thematic conference on Multiscale Methods and Validation in Medicine and Biology in San Francisco in 2012. In February 2016, Bill organized and hosted the third workshop on Multiscale Methods and Validation in Medicine and Biology at UCLA to bring together more than 50 scientists of mechanics and biology.

With this Special Issue, we honor Bill's impact and legacy within our community and his scientific contributions at the interface of computational mechanics and biology. He has a special place in our hearts, not only for his scientific achievements, but also because of his genuine warmth, kindness and compassion as a human being. He will be deeply, deeply missed.

Paul Barbone, Elisa Budyn, Adrian Buganza Tepole, Suvranu De, Daniel Ennis, Krishna Garikipati, Jean-Frédéric Gerbeau, Hector Gomez, Alain Goriely, Timothy Healey, Tom Hughes, Ellen Kuhl, Alison Marsden, Arif Masud, David Nordsletten, Assad Oberai, Tinsley Oden, Michael Ortiz, Luigi Perotti, Peter Pinsky, Aditya Ponnaluri, Alfio Quarteroni, Michael Sacks, Daniele Schiavazzi, Irène Vignon-Clémentel, Wolfgang Wall, Tom Yankeelov, Tarek Zohdi.