



JULIAN CLANCY FRAZIER

Julian Clancy Frazier is the son of Jean S. Clancy. Julian taught high school mathematics in Bradenton, Florida, while finishing his graduate studies at the University of South Florida (USF). He had studied Physics and Mathematics at Brown University, and received his undergraduate degree from New College in Sarasota, Florida. Julian focused on developing creative ways to help his students learn advanced algebra, geometry, and calculus. He wanted them to find it fun to learn and understand why mathematics was useful in life. His professors described him as having a VISION of making a difference and a PASSION for teaching. They recalled his exceptional personal attributes. The first was his innate ability to make mathematical ideas accessible to students. He was able to do this because of his very strong content knowledge base. Second was his intense passion when engrossed in the process of doing mathematics. And, lastly, the excitement that would literally radiate from him as he described his pedagogical strategies and outcomes.

In April of 2006, Julian suddenly became seriously ill. He miraculously survived an arduous, tenacious, and lengthy hospitalization in the intensive care unit, with around the clock care of his loving mother (a primary practitioner). He was airlifted from Florida to Santa Barbara, California, to further recover in the family home. After months of further medical care and physical therapy, he traveled briefly to his boyhood home in Maryland for a visit where he tragically, unexpectedly, and needlessly died on 7 December 2006, at the age of just 29 years old. Julian was completing the last course needed for his graduate degree.

In recognition of Julian's achievements as a new teacher and his work at USF, Dean Kennedy, the President of the College of Education, awarded Julian a Master of Arts in Teaching in Memoriam. Dean Kennedy, in his letter to Jean S. Clancy said the following, "A life well lived is determined not by the years on this earth, but by the lives that were touched along the way. It is clear that Julian left an indelible mark on so many lives during his short time with us. Julian is deeply missed by students and faculty in the USF College of Education and he will never be far from our thoughts. It is an honor for the University and College to award Julian's diploma as a symbol of his excellence in mathematics and teaching. It also represents our remembrance of a wonderful young man dedicated to serving others, Julian Clancy Frazier."

In order to establish an appropriate memoriam of her son and his dedication to mathematics and teaching, Jean S. Clancy has established a fund with the USNA Foundation. This fund has been used to create the Julian Clancy Frazier Mathematics Colloquium. This fund is also used to provide the annual Julian Clancy Frazier Award for Excellence in Mathematics.

JULIAN CLANCY FRAZIER MATHEMATICS COLLOQUIUM



MATHEMATICS OF FROZEN SEAS



Professor Kenneth Golden
University of Utah

WEDNESDAY
29 JANUARY 2025
MAHAN AUDITORIUM
1900-2000



PROFESSOR KEN GOLDEN



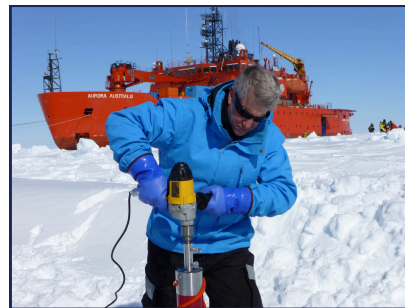
UNIVERSITY OF UTAH

Professor Ken Golden is a Distinguished Professor of Mathematics and Adjunct Professor of Biomedical Engineering at the University of Utah. His research interests span a diverse range of fields, including mathematics of sea ice and climate, polar ecology, composite materials, statistical physics, and remote sensing.

Professor Golden's interest in sea ice began in high school, studying satellite images of Antarctic sea ice at NASA's Goddard Space Flight Center. While double majoring in math and physics at Dartmouth College, he worked at the U.S. Army Cold Regions Research and Engineering Laboratory from 1977 to 1980 on measuring sea ice thickness with radar, treating sea ice as a composite of pure ice with brine inclusions. This work led to his 1984 Ph.D. from New York University (NYU) in Mathematics on the transport properties of composite materials. He studied diffusion processes and quasiperiodic media as a National Science Foundation (NSF) Mathematical Sciences Postdoctoral Fellow at Rutgers University. As an assistant professor of Mathematics at Princeton University from 1987 to 1991, he continued working in mathematical physics, and then moved to the University of Utah as an associate professor in 1991.

Throughout his career, Professor Golden has mentored 59 undergraduate researchers at the University of Utah from majors across the sciences and engineering, 18 Ph.D. and M.S. students, 10 postdoctoral fellows, and 18 high school students. Many of these students and postdocs have assisted in field experiments on sea ice in the Arctic and Antarctic.

Professor Golden has been on nineteen polar expeditions (seven to Antarctica and twelve to the Arctic) to obtain data that inform sea ice models. He has written close to 100 articles and given over 500 invited lectures on six continents, including four presentations to the U.S. Congress. He has won numerous awards for teaching, mentoring, and science communication. His research has been covered by media around the world, including profiles in Science, Scientific American, Physics Today, and by the BBC. He is an Inaugural Fellow of the American Mathematical Society, a Fellow of the Society for Industrial and Applied Mathematics, cited for "extraordinary interdisciplinary work on the mathematics of sea ice," a Fellow of the Electromagnetics Academy, and a Fellow of the Explorers Club, whose members have included Neil Armstrong, Jane Goodall, and Robert Peary. In 2014, he received the United States Coast Guard Arctic Service Medal.



ABSTRACT

The opening of the Arctic Ocean is expanding navigational, economic and scientific opportunities, yet is also increasing potential threats to our national security and demands on the U.S. Navy.

The sea ice cover and its future trajectory enter into any considerations of the polar marine environment. Advancing our ability to understand, model, and predict the behavior of sea ice is critical to improving climate and ocean models, and in assisting U.S. military missions in the Arctic.

As a material sea ice exhibits composite structure on many length scales. A principal challenge is how to use information on smaller scale structure to find effective properties on larger scales relevant to climate and ecological models.

From tiny brine inclusions to ice pack dynamics on oceanic scales, and from microbes to polar bears, we'll tour recent advances in modeling sea ice and recount our Arctic and Antarctic expeditions to obtain data that inform the models.