



Department of Mathematics

COLLEGE OF SCIENCE | THE UNIVERSITY OF UTAH

November 30, 2020

To the University Teaching Committee,

On behalf of the Department of Mathematics Awards Committee, we are writing to enthusiastically nominate Distinguished Professor of Mathematics **Kenneth M. Golden** for the **Calvin S. & Jeneal N. Hatch Prize in Teaching**. Professor Golden is a world-renowned applied mathematician with a primary focus in the area of mathematics of climate and sea ice, composite materials and homogenization for partial differential equations. Professor Golden is a prolific researcher and author with many papers in top journals in mathematics and science, an inspiring teacher, a passionate and dedicated mentor.

During his career at the University of Utah since 1991, Professor Golden generously shared his knowledge and experience while training and inspiring generations of students. Since 2001, Professor Golden has taught more than 6000 students, mostly freshmen and sophomores, in more than 40 sections of *Calculus I, II or III*. Mathematics can be a very intimidating subject at first for some students, while others may find it difficult to connect to real life and their future careers. In his calculus lectures, Professor Golden creatively integrates transformative mathematical ideas and examples, including illustrative examples from his research, to make students excited about the subject, to relate mathematics to their lives and to show that calculus provides a foundation for science and engineering. In the teaching evaluations for calculus courses that Professor Golden taught over the years at the U, many students comment about his infectious enthusiasm for the subject and his highly engaging lectures. Moreover, many students who selected mathematics as their major or minor acknowledge that Professor Golden's calculus courses were instrumental in their decisions. Here are some of the quotes from teaching evaluations for Math 1210 (Calculus I) Fall 2018 and for Math 2210 (Calculus III) Fall 2019: "He was fantastic at presenting the course content while engaging students; I was enthralled and I'm typically bored by pure mathematics. His office hours were set up in a helpful way and I appreciated the set time on Monday rather than being 100% by appointment. Just overall a great teacher." "The instructor was very effective at getting me interested in the subject and helping me to understand concepts. I honestly felt like this instructor wanted me to succeed and understand this subject." "He was always so excited to teach! He loves math and it really reflects in the way he teaches; it's awesome! I don't know how he did it but my friends and I could do integrals and derivatives in our SLEEP." "Professor Golden gets very excited when talking about math which in turn makes me more excited to learn about it. He also clearly wanted people to succeed in the class so he did his best to make sure we were prepared for exams, including doing a several hour review session for anyone interested before every exam. This helped me be much more prepared for tests than I would have been studying on my own." "Outstanding professor! He was passionate about the material he taught and really cared if his students understood the content. His exams covered the most important topics and most relevant to real life scenarios." "This was the best math class ever, and actually one of the best classes in general."

Professor Golden has also designed several topics courses, such as a course on composite materials and homogenization, a course on sea ice, and his most recent course on mathematics and climate. The goal of the course "*Mathematics and Climate*" Math 5750 (undergraduate)/Math 6880 (graduate) is to introduce students to the mathematical modeling of Earth's climate system and to equip students with ideas and tools which are important for understanding and tackling current pressing challenges of climate change. In addition, the course is designed in a way that it is accessible to many undergraduate students interested in science or engineering, and has attracted students from biology, chemistry, mathematics, physics, atmospheric sciences, geology, geophysics and areas in engineering. The "*Mathematics and Climate*" course appeared as a result of Professor Golden's role as a Principal Investigator of an NSF funded Math Climate Research Network of 12 hubs at major research universities across the

U.S., including the University of Utah. One of the aims of the Math Climate Research Network was to create cutting-edge educational materials for the emerging field of climate math. Here are some of the quotes from Math 5750/Math 6880 students' teaching evaluations from Spring 2020: "Fascinating subject and great class structure built on learning and not testing. class participation in discovery and discussions was great." "Ken Golden lives for Sea Ice and this class basically a dive into his world. I loved it. He knows so much and has a clear desire to learn and teach more. The presented material from his own research and experiences really gave the class a personal and relative touch which is often lacked." "I appreciated learning about climate from a math-modeling point of view from an expert in the field. Dr. Golden did a fantastic job teaching in person, inviting discussion, and encouraging further interest in the field. When we had to change to an online format Dr. Golden did a wonderful job transitioning the experience. He made videos for us to use to continue to learn and was understanding and easy to talk to."

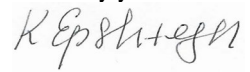
Professor Golden is a genuinely committed and passionate mentor. During his tenure at the U, he successfully advised 10 high school students, more than 50 undergraduate research students (with majors from the Colleges of Science, Engineering, and Mines and Earth Sciences), 16 Ph.D. and Master's students and 8 postdoctoral fellows. Many of the students and postdocs have assisted in Professor Golden's field experiments on sea ice in the Arctic and Antarctic. The high school students that worked with Professor Golden went to top universities, such as Yale, MIT, Columbia and Princeton. Two of his undergraduate research students, Rebecca Hardenbrook (2018) and Delaney Mosier (2020) won the College of Science Research Scholar Award, the highest research honor given to an undergraduate student in the College of Science. His graduate students and postdoctoral fellows have gone on to successful careers in academia and industry. In addition, Professor Golden works tirelessly towards increasing diversity and broadening participation within STEM disciplines. In particular, he is actively involved in ACCESS within the College of Science. The goal of this program is to encourage young women (usually high school students) to consider careers in STEM. Since 2016, Professor Golden has mentored several ACCESS students, and more recently has led the development of and co-taught (jointly with Professor Chaika) a new mathematics component of ACCESS on climate and energy, as part of an expansion of ACCESS beyond the College of Science.

Professor Golden is also a highly sought-after lecturer and public speaker. So far, Professor Golden has given more than 400 invited lectures around the world, including 3 presentations in the US Congress where he represented the American Mathematical Society and the Society for Industrial and Applied Mathematics. His invited lectures include very prestigious public and keynote lectures in Mathematics and Science, such as the *Porter Public Lecture* at the Joint Math Meetings (the largest annual mathematics conference in the world), and featured lectures at the First National Math Festival at the Smithsonian Institution in Washington DC, at the National Museum of Mathematics in New York City, at Dartmouth's 250th anniversary, and at the 2013 Institut des Hautes Études Scientifiques (IHÉS) Gala, *Mathematics: Mind of the Earth*, hosted by the French Ambassador to the US in New York City, where Professor Golden was also the guest of honor. Professor Golden delivered numerous public lectures at universities in the US and abroad, and many presentations to students at all levels, from elementary school students to high school and college students, as well as talks to groups of business leaders and policy makers. In addition, Professor Golden's research and polar expeditions have been covered extensively in newspapers, magazines, and web articles, including profiles in *Science*, *Scientific American* and *Physics Today*, as well as on radio and television.

Professor Golden is a Fellow of the Society for Industrial and Applied Mathematics (SIAM), for "extraordinary interdisciplinary work on the mathematics of sea ice", as well as an Inaugural Fellow of the American Mathematical Society (AMS). As a prolific researcher, exceptionally dedicated mentor, talented and inspiring teacher, Professor Golden has been recognized with the *University of Utah Distinguished Teaching Award* (2007), the *University of Utah Distinguished Scholarly & Creative Research Award* (2012) and the *College of Science Myriad Faculty Award for Research Excellence* "for fostering undergraduate research and providing learning experiences for students" (2012), among his numerous national and international accolades.

Distinguished Professor Kenneth M. Golden is a tremendous asset to the Department of Mathematics and the University of Utah. We give him our **highest recommendation** for the Calvin S. & Jeneal N. Hatch Prize in Teaching.

Sincerely yours,

A handwritten signature in black ink, appearing to read 'K Epshteyn', written in a cursive style.

Yekaterina Epshteyn (Chair, Faculty Awards Committee, Department of Mathematics)