



# *Distinguished Lecture Series*

## *Public Lecture*

# Mathematics: A Driver of Precision Medicine



## **Professor Reinhard C. Laubenbacher** **University of Connecticut Health Center**

**Human Sciences 169**

**Wednesday, April 13, 2016 at 4:00 p.m.**

**Reception after the lecture in the Canyon Room (near HS 169)**

### **ABSTRACT:**

Powerful forces are reshaping healthcare in the United States, in ways we have hardly imagined possible. This new era of medicine will fundamentally change the treatments we receive and how we receive them. Technological advances in genetic sequencing continue to deepen our understanding of the genetic component of diseases, such as cancer, and have already led to a new generation of cancer treatments. The phenomenal computing power we carry around in the palm of our hands everyday - our smartphone - is already providing entirely new approaches to treatment of diseases such as diabetes, with a swipe of a screen. Virtual warehouses of data including our medical records and information streamed from the flood of wifi devices in our homes and on our bodies will allow us to assess the impact of everyday activities on our health. Turning this surplus of data into medical care that is customized to each person's body and life history is known as "precision medicine." Early in 2015 this concept became nationally recognized when the President announced the 'Precision Medicine Initiative.' Our success in making precision medicine a wider reality hinges crucially on our ability to turn an abundance of data into information about an individual's healthcare needs. It is well known that at the numerous crossroads on this journey, technology has helped steer us forward. What is less well known is that at every turn, the mathematical sciences have been a driver of that technology and its use. Mathematics is in fact providing a key enabling technology that helps us make data-driven healthcare a reality for millions. The goal of this presentation is to explore precision medicine, and demonstrate the power of mathematics to transform our approach to healthcare by way of several case studies. No specialized knowledge of either mathematics or medicine is required from the audience.

### **BRIEF BIOGRAPHY:**

Dr. Reinhard Laubenbacher received his PhD in Mathematics in 1985 from Northwestern University. He held professorships at New Mexico State University and Virginia Tech in the Department of Mathematics and in the Virginia Bioinformatics Institute (VBI). He was Director of Education & Outreach from 2008 to 2013 at VBI and is founder and President of Kid's Tech University (<http://kidstechuniversity.org>). Currently, Dr. Laubenbacher is the Founding Director of the Center for Quantitative Medicine at the University of Connecticut Health in Farmington, Connecticut (2013 to present). He is also a Professor in the Department of Cell Biology, School of Medicine at University of Connecticut and Professor of Computational Biology at Jackson Laboratory for Genomic Science. Among his many honors, Dr. Laubenbacher was named a Fellow of the American Mathematical Society in 2012 and a Fellow of the American Association for the Advancement of Science in 2015. Dr. Laubenbacher serves on many editorial boards and is currently Co-Editor-in-Chief of the *Bulletin of Mathematical Biology*. He has received funding in support of research and education from the National Institutes of Health, National Science Foundation, Los Alamos National Laboratory, U. S. Department of Defense and U.S. Army Research Office. He has published over 100 articles, 20 book chapters and 5 books and has supervised 20 PhD students and 7 postdoctoral fellows.

### **SPONSORS:**

- Linda J.S. Allen, Horn Professor, Texas Tech University
- Department of Mathematics and Statistics, Texas Tech University