OPENING SPEAKER: SUZANNE L. WEEKES

MATHEMATICAL MODELING IN CANCER RESEARCH

Cancer research is no longer solely the domain of biologists, oncologists, and other physicians and bench scientists. Mathematicians use modeling and computer simulation to further the understanding of these diseases by developing quantitative descriptions to biological theories at various scales. The analytical and numerical results of these models can be compared to clinical and laboratory data to gain further insights. Results from these models can also be used to drive the design of in vitro or in vivo experiments and are used to develop new paradigms or to challenge existing theories. In this talk, the speaker will give a taste of some mathematical and computational models used by quantitative scientists working to understand the biology and dynamics of cancer.
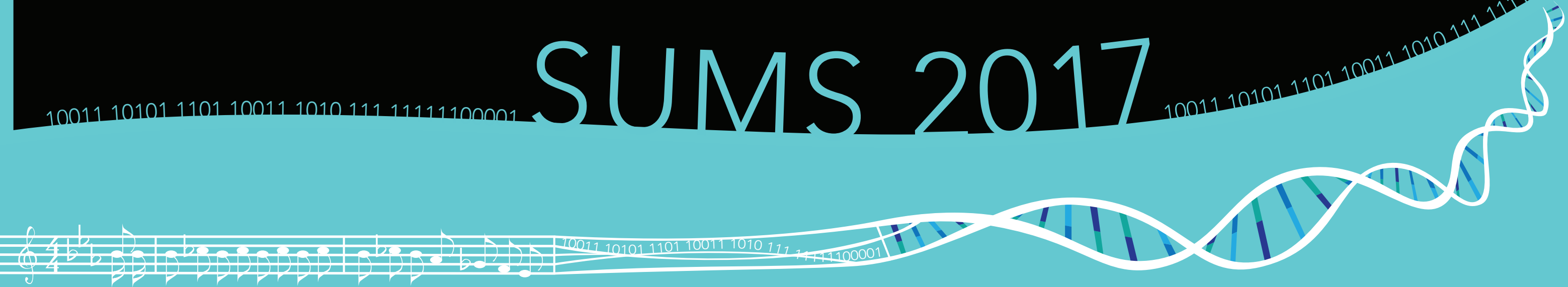
CLOSING SPEAKER: DAVE KUNG

THEORY & PRACTICE: MATHEMATICS AND MUSIC

The two subjects of math and music are connected in myriad ways, from the rhythm of notes to the frequencies of the pitches. At the advanced level, both mathematical theories and music theories help us understand the other subject. In this talk, we first explore what mathematics tells us about musical instruments, the basic tools of musical practice. In the second half, we flip sides, looking at music theory and how the structure of chords gives us another way to understand topological structures (circles, Möbius strips and higher dimensional tori), some of the basic tools of mathematical practice. Thus the first half connects mathematical theory to musical practice, and the second connects musical theory to mathematical practice. Throughout, examples played on the violin will illustrate all of these beautiful and surprising connections.

Photo courtesy of St. Mary's College of Maryland

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SHENANDOAH UNDERGRADUATE MATHEMATICS AND STATISTICS CONFERENCE
JAMES MADISON UNIVERSITY
OCTOBER 7, 2017

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