



Séminaires
du
LAAS-CNRS



Laboratoire d'Analyse et d'Architecture des Systèmes du CNRS

PRECISION MEASUREMENT IN BIOLOGY

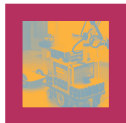
par

Stephen R. QUAKE

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Mercredi 9 juillet à 14 h 00

LAAS-CNRS - Salle de Conférences



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**Pôle
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résumé de l'exposé

Is biology a quantitative science like physics? I will discuss the role of precision measurement in both physics and biology, and argue that in fact both fields can be tied together by the use and consequences of precision measurement.

The elementary quanta of biology are twofold: the macromolecule and the cell. Cells are the fundamental unit of life, and macromolecules are the fundamental elements of the cell. I will describe how precision measurements have been used to explore the basic properties of these quanta, and more generally how the quest for higher precision almost inevitably leads to the development of new technologies, which in turn catalyze further scientific discovery. In the 21st century, there are no remaining experimental barriers to biology becoming a truly quantitative and mathematical science.

l'orateur



Stephen R. Quake is a professor of bioengineering at Stanford University. He earned his doctor of philosophy in 1994 from Oxford University. After a postdoc at Stanford, he began his independent career at the California Institute of Technology in 1996, where he rose through the ranks to become the Thomas E. and Doris Everhart Professor of Applied Physics and Physics. Dr. Quake's lab is broadly interested in biophysics and bioengineering, and uses techniques such as single molecule spectroscopy and microfluidics to address a variety of fundamental and technological questions.

His interests unite physics, biology, and biotechnology. Over the past five years, he has focused on understanding the basic physics microfluidic technology, and how that biology can be applied to biological problems. His group pioneered the development of microfluidic large-scale integration (LSI), demonstrating the first integrated microfluidic devices with thousands of mechanical valves. This technology is helping to pave the way for large-scale automation of biology at the nanoliter scale. He and his students have been exploring applications of this «lab on a chip» technology in diverse areas such as functional genomics, genetic analysis, microbiology, and structural biology. Dr Quake is a recipient of the 2004 National Institutes of Health Director's Pioneer Award.