

# Signatures of Nonequilibrium Fluctuations in Life

**25 - 29 May 2020**  
**Trieste, Italy**



Further information:  
<http://indico.ictp.it/event/9091/>  
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Life is a nonequilibrium phenomenon, requiring the constant consumption of energy to circumvent the pernicious effects of fluctuations. Recent advances in experimental techniques and in the theory of nonequilibrium processes offer new opportunities for the study of fluctuations in biological systems.

What are the energetic costs of key processes needed to sustain life at the cellular level? What statistical features are unique in biological systems? How can we harvest energy efficiently from living matter? What is the biological relevance of fundamental results such as the fluctuation theorems and the thermodynamic uncertainty relation?

This workshop aims at gathering active scientists (experimentalists and theorists) from different domains across physics and biology who have made significant contributions to address fluctuations in living systems. The workshop will provide a unique framework for researchers from developing countries to establish a scientific dialogue with their counterparts from around the world performing cutting-edge research in physics and biology. Students and early career scientists will get a flavour of the possibilities and outstanding questions in biophysics.

The aim of the workshop is to discuss existing efforts on understanding nonequilibrium fluctuations using biological and physical methods, but more importantly, to identify future questions in this domain and the collaborations that will help to answer them.

## Key topics include:

- Sensory systems, oscillators and memory
- Active matter
- Cytoskeleton and membrane dynamics
- Molecular motors
- Nonequilibrium thermodynamics

## How to apply:

Online application:  
<http://indico.ictp.it/event/9091/>

Female scientists are encouraged to apply.

## Grants:

A limited number of grants are available to support the attendance of selected participants, with priority given to participants from developing countries. There is no registration fee.

## Speakers:

Anjana Badrinarayanan, NCBS, Bangalore  
Urna Basu, Raman Institute  
John Bechhoefer, Simon Fraser U.  
Gili Bisker, Tel Aviv U.  
Nikta Fakhri, MIT  
Stephan Grill, MPICBG, Dresden  
Jonathon Howard, Yale U.  
Jim Hudspeth, Rockefeller U.  
Frank Jülicher, MPIPKS, Dresden  
Sabine Klapp, TU Berlin  
Anatoly B. Kolomeisky, Rice U.  
Sandhya Koushika, Tata Inst. for Fundamental Research, Mumbai  
Vijaykumar Krishnamurthy, ICTS Bangalore  
Christian Maes, KU Leuven  
Pascal Martin, Institut Curie  
Hiroyuki Noji, Tokyo U.  
Juan Parrondo, Universidad Complutense de Madrid  
Nenad Pavin, Zagreb U.  
Luca Peliti, SMRI Rome  
Simone Pigolotti, OIST  
Thomas Pucadyil, IISER Pune  
Hong Qian, Washington U.  
Madan Rao, NCBS, Bangalore  
Felix Ritort, Barcelona U.  
Udo Seifert, Stuttgart U.  
Pieter Rein Ten Wolde, AMOLF  
Iva Tolic, Ruder Boskovic Institute, Zagreb  
Suri Vaikuntanathan, Chicago U.  
Sandhya S. Visweswariah, Indian Institute of Science, Bangalore

## Organizers:

Vaishnavi Ananthanarayanan, Indian Institute of Science  
Jordan M. Horowitz, University of Michigan  
Saar Rahav, Technion  
Edgar Roldán, ICTP

## Local Organizer:

Antonio Celani, ICTP

## Deadlines:

**7 March 2020**

for applications with financial support

**20 April 2020**

for applications without financial support

