

IUPAP Commission on Biological Physics (C6)

Report on Activities from January 2022 to September 2024

Masaki Sasai: Chair

Patricia Bassereau: Vice Chair

Jeff Gore: Secretary

1. C6 Membership (2021-2024)

Name	Country/Affiliation	Gender	Roles
Masaki Sasai	Japan	M	Chair
Patricia Bassereau	France	F	Vice-Chair
Jeff Gore	US	M	Secretary
Qi Ouyang	China (Beijing)	M	Member
Hans-Joachim Galla	Germany	M	Member
Prabal Kumar Maiti	India	M	Member
Laura Franca Cantù	Italy	F	Member
Jong-Bong Lee	Korea	M	Member
Joanna Trylska	Poland	F	Member
Kristian Muller-Nedebock	South Africa	M	Member
Juan M.R. Parrondo	Spain	M	Member
Suliana Manley	Switzerland	F	Member
Chia-Liang Cheng	China (Taipei)	M	Member
Pietro Cicuta	UK	M	Member
John Damilakis	AC4 (Medical Physics)	M	Associate Member
Peter Pohl	IUPAB Council	M	Associate Member

A member of C6 from Italy, Dr. Laura Franca Cantù, passed away on August 5th, 2022. The vacant position has not yet been filled, and C6 was operated by 13 members + 2 associate members.

2. Launching a new prize, the IUPAP Medal for the Physics of Life

A new prize was proposed by the C6 from the last term (2017-2021) to award senior scientists in Biological Physics. The prize name, purpose, category of the award, and rules and organization of the selection committee were discussed and determined by the present term C6 (2021-2024). The award was named "The IUPAP Medal for the Physics of Life" to encompass all fields of Biological Physics, including quantum, atomic, and structural molecular biophysics, cell biophysics, neural and brain physics, ecological and evolutionary physics, and so on. The rules for the award include the following points:

1. The award consists of a gilded medal and a certificate.
2. The award recognizes exceptional achievements in Biological Physics, without regard for the nominee's country of research, age, or employment status.
3. The recipient must not have previously received the IUPAP Medal for the Physics of Life or the Nobel Prize.
4. Normally, the award is given to one recipient but can exceptionally be shared by two.
5. Members of the Selection Committee are not eligible for the award.
6. Committee members with Conflicts of Interest (COI) should disclose them to the entire Committee.
7. Committee members are not allowed to disclose information about the Committee's business to individuals outside of the selection process.

The Selection Committee was chaired by Dr. Patricia Bassereau (the C6 Vice Chair) and constituted by the C6 members, two recent Chairpersons of the C6, and three previous awardees of the IUPAP Early Career Scientist Prize or Young Scientist Prize in Biological Physics.

Nominations for the Medal for the Physics of Life were called for from Aug. 2022 to Nov. 2022. The Selection Committee carefully reviewed the nominations from Dec. 2022 to March 2023 through readings, voting, email discussions, and Zoom meetings, and ultimately selected the following two awardees.



Prof. John J. Hopfield
Professor Emeritus at Princeton University,

“For his pioneering contributions to a wide range of biological physics, including cooperativity and electron transfer in proteins, proofreading in molecular information transmission, and concepts and applications of nonlinear dynamics of neural networks, which set a foundation for the modern engagement of theoretical physics with the phenomena of life.”



Prof. Frank Jülicher
Director at the Max Planck Institute for the Physics of Complex Systems in Dresden,

“For his key contributions to biological active matter physics, shedding light on the physical mechanisms that underlie cellular processes, including cooperative molecular motors; hearing; flagellar beat; active gels, fluids, and droplets; the active cell cortex; tissue growth and patterning; protein phase separation in cells; and self-organization of active surfaces.”

C6 designed the new medal, which was presented to the awardees in the awarding ceremony held during the ICBP2023 in Seoul, Korea.



3. The IUPAP Early Career Scientist Prize 2022 and 2023 in Biological Physics

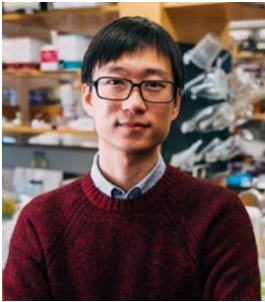
Nominations for the Early Career Scientist Prize (ECSP) were called for from Nov. 2022 to Jan. 2023. The selection was led by Dr. Jeff Gore (the C6 Secretary) and made through votes and discussion by the C6 members. The two awardees are



Dr. Ricard Alert (2023 ECSP Awardee)

Max Planck Institute for the Physics of Complex Systems, and Center for Systems Biology Dresden, Germany

“For revealing how new phenomena in active matter underlie a wide range of biological processes, from the spreading of epithelial tissues, to turbulent-like flows in cytoskeletal networks, to the formation of fruiting bodies in bacterial colonies.”



Dr. Ming Guo (2022 ECSP Awardee)

Department of Mechanical Engineering, Massachusetts Institute of Technology, USA

“For his groundbreaking development of novel biophysical tools which, in turn, enabled his discovery of physical laws governing interactions of subcellular structures across scales of length from molecule to cytoskeleton to tissue, and across conditions spanning normative physiology, embryonic development and cancer invasion.”

The awarding ceremony was held during ICBP2023 in Seoul, Korea.

4. The ICBP2023 in Seoul, Korea

C6 planned the flagship conference in Biological Physics, the 11th International Conference on Biological Physics (ICBP2023). The ICBP2023 was held in Seoul, Korea, from Aug. 14 to 18, 2023.

The Division of Biological Physics, which is a newly founded division in the Korean Physical Society, organized the ICBP2023 by forming the Organizing Committee. The Organizing Committee was chaired by a C6 member, Dr. Jong-Bong Lee, from Pohang University of Science and Technology. The conference program was discussed among members of the International Committee and the Program Committee. The Program Committee was co-chaired by Dr. Kyoung Jin Lee from Korea University and Dr. Changbong Hyeon from Korea Institute for Advanced Study.

The conference attracted 720 participants from 27 countries, including 350 women participants. The conference had 62 sessions on 19 themes covering a wide range of fields of modern Biological Physics. 547 papers were presented, including 144 invited talks, of which 30 invited talks were given by women scientists.

The conference had a plenary session for “the IUPAP Medal for the Physics of Life,” in which the lectures were given by two award recipients. The conference also had a session for the Early Career Scientist Award (ECSA2022 and ECSA2023) and the Young Scientist Prize (YSP2020 and YSP2021). The YSP awarding ceremony was originally planned to be held in 2022 but postponed due to the pandemic, which was realized in the ICBP2023 opportunity as a combined event with the ECSA awarding ceremony. Travel expenses of the awardees were supported by the C6 budget.

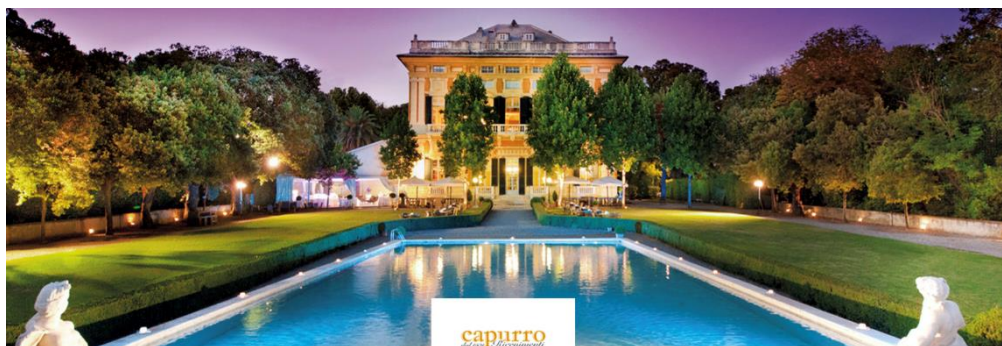
5. Cooperation with IUPAB

C6 has initiated a collaboration with the International Union for Pure and Applied Biophysics (IUPAB). Dr. Peter Pohl, a council member of IUPAB, has joined C6 as an associate member. The organizing committee of ICBP2023 has invited the organizers of the IUPAB2024 conference to participate and collaborate in the ICBP2023 organization. This collaboration resulted in a symposium titled "Rising Stars in Structural Biology" during the ICBP2023 event. Furthermore, the IUPAB2024 conference, which took place in Kyoto, Japan in July 2024, saw C6 being invited by the IUPAB organizers to conduct a session. This session, titled "Soft Matter Biophysics," was chaired by Drs. Patricia Bassereau and Masaki Sasai during the IUPAB2024 conference.

6. The ICBP2026 in Genova, Italy

C6 planned the next ICBP, which will be held from June 29th to July 5th of 2026 in Genova, Italy.

The Organizing Committee chair is Dr. Alberto Diaspro from the Department of Physics, Università di Genova.



7. Cooperation with the Soft Matter Physics community

C6 joined the activity of the newly organized Soft Matter Association of the Americas (SMAA), by nominating a C6 member, Dr. Pietro Cicuta, to the Advisory Board of SMAA.

8. Women in C6

C6 recognizes the importance of gender diversity in IUPAP activities. The 2021-2024 term has four women members, and C6 recommended six women member candidates, including two women officers, for the next term (2024-2027) C6.

The ICBP2023 Report

The 11th International Conference on Biological Physics (ICBP2023) was held in Seoul, Korea, from Aug. 14 to 18 2023.

The ICBP2023 was organized by the Division of Biological Physics in the Korean Physical Society, and the Organizing Committee Chair was Prof. Jong-Bong Lee from Pohang University of Science and Technology.



The conference attracted 720 participants from 27 countries, and 547 papers were presented. The conference had 19 symposia on the following themes;

1. Biological Frontiers of Soft Matter Physics
2. Application of Machine Learning to Biological Physics
3. Active Matter in Biology
4. Mechanobiology
5. Origin of Living Matter
6. Quantum Mechanical Processes in Biological Systems
7. Single Molecular Biophysics
8. Single Cell Biophysics & Super-resolution Microscopy
9. Chromosome/Nucleus Dynamics
10. Biological Network
11. Ecology and Evolution of Microbial Communities
12. Biophysics of Protein Folding
13. Phase Separation in Biology
14. Molecular Simulations of Biomolecules
15. IUPAB Symposium: Rising Stars in Structural Biology
16. Biophotonics
17. Protein Structure & Function
18. Brain Science
19. Novel Approaches to Biophysics



The Plenary lecturers and themes were the following;

Prof. Taekjip Ha (Johns Hopkins University)

From Single Molecules to Cellular Decision Making: Connecting the Scales Using Mechanical Force

Prof. Rohit V. Pappu (Washington University in St. Louis)

Hidden Complexities in Near Equilibrium Physics of Biomolecular Condensate Formation

Prof. John J. Hopfield (Princeton University)

The Choice of a Problem

Prof. Frank Jülicher (Max Planck Institute for the Physics of Complex Systems)

Active Processes in Cells and Tissues

Prof. Jean-François Joanny (Collège de France)

Geometry and Rheology of Epithelial Tissues

The ICBP2023 had award ceremony sessions for the IUPAP Medal for the Physics of Life and for the Early Career Scientist Prize. The awardees gave their memorial lectures in these sessions.

