

# Seth Fraden

## Biographical Sketch for IUPAP Commission C7 on Soft Matter

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### Professional Profile

Seth Fraden is a Professor of Physics at Brandeis University and an experimental soft matter physicist whose work connects physics, chemistry, biology, and materials science. His laboratory combines experiment, theory, and simulation to study active matter, nonlinear chemical dynamics, microfluidics, and programmable self-assembly using DNA origami and de novo proteins. The research aims both to establish physical principles for nonequilibrium and self-organizing materials and to translate those principles into bioinspired systems.

### Education and Appointments

| Period          | Education and appointment                                                    |
|-----------------|------------------------------------------------------------------------------|
| 1979            | BA in Physics, University of California, Berkeley                            |
| 1987            | PhD in Physics, Brandeis University, advised by Robert B. Meyer              |
| 1987 to 1989    | Postdoctoral Fellow, Max Planck Institute for Solid State Research, Grenoble |
| 1989 to present | Faculty member in Physics, Brandeis University; Professor since 2003         |
| 2023 to 2025    | Interim Co-Chair of Engineering, Brandeis University                         |

### Scientific Leadership and Service

Fraden directed the National Science Foundation Bioinspired Soft Materials Research Science and Engineering Center at Brandeis from 2012 to 2024. The center brought together 17 faculty members from six departments, and he led it through two national competition cycles. He has supervised 22 doctoral students and sponsored 17 postdoctoral researchers. He co-chaired the 2015 Gordon Research Conference on Soft Condensed Matter and has co-organized the New England Complex Fluids Workshop since 1999. In 2024, the Max Planck Society President appointed him to a six-year term as Chair of the Scientific Advisory Board of the Max Planck Institute for Dynamics and Self-Organization. In July 2025, he began a three-year term on the Condensed Matter and Materials Research Committee, a standing committee of the Board on Physics and Astronomy of the National Academies of Sciences, Engineering, and Medicine. At Brandeis, he has served on the Faculty Senate Council since 2025 and was reelected for the 2026–27 academic year as the representative of the School of Science, Engineering and Technology.

### IUPAP and International Soft Matter Service

As a member of IUPAP Working Group 15 on Soft Matter, Fraden participated in reviewing International Soft Matter Conference proposals and in efforts to maintain the conference's rotation among world regions. He served on the International Program Committee for ISMC 2024 in the United States and contributed to the transition of WG15 into Commission C7 on Soft Matter. He continues this work as a C7 member and serves on the Advisory Board of the Soft Matter Association of the Americas. His experience in interdisciplinary research, international conference planning, regional community building, education, and university-industry engagement is directly relevant to C7's work on the ISMC series, awards, commission membership, and coordination across IUPAP and partner organizations.

### Selected Honors

- Fellow of the American Physical Society, elected in 2020 for leadership in experimental soft matter physics
- Innovation Prize of the International Organization of Biological Crystallization, 2008, for microfluidic methods for high-throughput protein crystallization
- National Science Foundation fellowship for scientific exchange with industrialized countries, 1987 to 1989