Numbers and Nature
A symposium to celebrate the life and legacy of Mitchell J. Feigenbaum.

Executive Committee: David Campbell (BU), Predrag Cvitanović (Georgia Tech), Gemunu Gunaratne (U. Houston), and Daniel Rothman (MIT).

International Advisory Committee: Sir Michael Berry (U Bristol), Leonid Bunimovich (Georgia Tech), Giulio Casati (Insubria), Fred Cooper (Los Alamos), Mogens Jensen (Niels Bohr Institute), Leon Glass (McGill), Nigel Goldenfeld (UC San Diego), Joel Lebowitz (Rutgers), Albert Libchaber (Rockefeller), Marcelo Magnasco (Rockefeller), Renu Malhotra (U Arizona), Yves Pomeau (Ecole Normale), Itamar Procaccia (Weizmann Institute), Sara A. Solla (Northwestern), Harry Swinney (U Texas)

Sponsored by the School of Science, the Lorenz Center, the David and Edith Harris Fund, and the Departments of Physics and of Earth, Atmospheric and Planetary Sciences.

Thursday, June 2, 2022
Lecture Hall 6-120

8:30  Registration
9:00  Welcome
Daniel Rothman — Professor of Geophysics and Co-Director of the Lorenz Center, MIT-EAPS
Gemunu Gunaratne — Moores Professor of Physics, University of Houston

MORNING LECTURE SESSION 1
9:10  Maps and Shapes
L. Mahadevan — Professor of Physics, de Valpine Professor of Applied Mathematics, and Professor of Organismic and Evolutionary Biology, Harvard

Geometry, Topology, and Electrophysiology
Adam Cohen — Professor of Chemistry, Chemical Biology, and Physics, Harvard

Mitchell’s Role in Chaos (Presented via Zoom)
Albert Libchaber — Detlev W. Bronk Professor of Physics, Rockefeller University

10:40  Coffee Break | Chipman Room, 6-104

MORNING LECTURE SESSION 2
11:00  Ein Sturm im Wasserglas
Bjorn Hof — Professor of Physics, IST Austria

Hydrodynamics and Microbes
Alex Petroff — Professor of Physics, Clark University

Life and Death of Turbulence (Presented via Zoom)
Nigel Goldenfeld — Swanlund Chair, Center for Advanced Study Professor of Physics, UC San Diego

12:30  Lunch on your own
AFTERNOON LECTURE SESSION 1

2:00  Optics, Vision, and Evolution After Mitchell Feigenbaum
      Jean-Pierre Eckmann — Professeur Honoraire, University of Geneva

      The DeltaCEL T Rattleback and Anamorphic Images
      Ken Brecher — Professor of Astronomy and Physics, Emeritus, Boston University

      Stories of Fluids and Light (Presented via Zoom)
      Reymond E. Goldstein — Schlumberger Professor of Complex Physical Systems, Univ. of Cambridge

      Mathematics, Computation, and Nature
      Stephen Wolfram — Founder and CEO, Wolfram Research

4:00  Coffee Break | Chipman Room, 6-104

KEYNOTE LECTURE

4:30  Four Illusions
      Sir Michael Berry — Melville Wills Professor of Physics (Emeritus), University of Bristol

6:00  Public Reception | Ida Green Lounge, 9th Floor, Building 54

7:30  Dinner | Morss Hall, Walker Memorial, Building 50 — by invitation, preregistration required

Friday, June 3, 2022

8:30  Registration

MORNING LECTURE SESSION 1

9:00  Turbulence, From Newton’s Quadratic Law of Drag to Mitchell Feigenbaum and Recent Times
      Yves Pomeau — Emeritus Research Director, French National Centre for Scientific Research

      Broken Symmetries in Living Systems
      Nikta Fakhri — Thomas D. and Virginia W. Cabot Career Development Professor, MIT-Physics

      Overcoming the Random Closed Packed Barrier: Crystallization in Granular Media
      (Presented via Zoom)
      Harry Swinney — Professor Emeritus, University of Texas at Austin

10:30 Coffee Break | Chipman Room, 6-104
MORNING LECTURE SESSION 2

11:00  Singularity in a Teacup — When Nature Gives Infinity
       Dwight Barkey — Professor of Mathematics, University of Warwick

       Vortex Sheets and Turbulent Statistics (Presented via Zoom)
       Sasha Migdal — Research Professor of Physics, NYU

       Venus as a Potentially Habitable Planet
       Sara Seager — Class of 1941 Professor of Planetary Science, Professor of Physics, and Professor of Aeronautics and Astronautics, MIT-EAPS, Physics and AeroAstro

12:30 Lunch on your own

AFTERNOON LECTURE SESSION 1

2:00  Encoding Patterns in Single-Cell Locomotion: Oscillations, Synchronization, and Excitability
       Kirsty Wan — ERC Starting Grantee, Senior Lecturer, University of Exeter

       The Mysteries of Gaps and Pile-Ups at Planetary Resonances
       Renu Malhotra — Louise Foucar Marshall Science Research Professor and Regents Professor of Planetary Sciences, University of Arizona

       Neural Manifolds for Control of Movement (Presented via Zoom)
       Sara A. Solla — Professor of Neuroscience and Physics, Northwestern

3:30 Coffee Break | Chipman Room, 6-104

AFTERNOON LECTURE SESSION 2

4:00  Hydrodynamic Quantum Analogs
       John Bush — Professor of Applied Mathematics and Fluid Dynamics, MIT-Math

       Shocks and Surprises: Screening of Elasticity by Plastic Charges in Amorphous Solids
       Itamar Procaccia — Barbara and Morris L. Levinson Professorial Chair in Chemical Physics, Weizmann Institute of Science

       Glassy Dynamics in Earth's Carbon Cycle
       Dan Rothman — Professor of Geophysics and Co-Director of the Lorenz Center, MIT-EAPS

5:30 Adjourn
Non-MIT Attendees — Tim Ticket registration and Covid health attestation required for campus access.

Using your smartphone, scan this QR code to be taken to MIT’s Tim Ticket website. Follow these steps to complete your Tim Ticket registration:

- Click or tap on Visitor.
- Enter your mobile number and click Send OTP to receive a one-time PIN code via SMS.
- Enter the PIN code you received and tap Login.
- Enter your contact details and complete the health attestation.
- The app will display a private QR code for you to scan at the electronic readers stationed outside building entrances to gain access.
- Present your Tim Ticket QR code below the scanner. You can display your QR code from the MIT Tim Tickets mobile application or by printing it out from the visitors.mit.edu website.
- Scan your QR code by holding your phone at least 6 inches below the scanner, with the QR code face up.
- Do not hold your phone in front of the scanner, too close to the scanner, or with the screen facing away from the scanner.

You must repeat the health attestation each day prior to visiting campus.

Questions? Email Alma Pellecer: pellecer@mit.edu