

INSTITUTE OF ADVANCED STUDIES IN MATHEMATICS

Technion-Israel Institute of Technology



INTERNATIONAL WORKSHOP

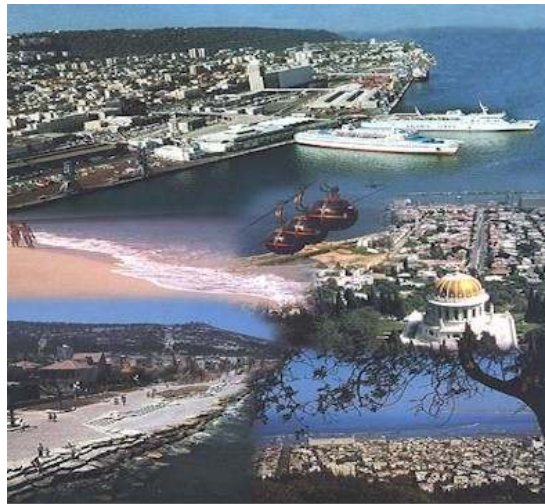
on

BIOFLUIDDYNAMICS

(in memory of Sir James Lighthill)

4-7 January, 2000

Haifa, Israel



This event will be combined with the Annual Meeting of the Israeli Society for Theoretical and Mathematical Biology, which will take place on Wednesday, 5 January, 2000.

The workshop is in memory of Sir James Lighthill, an outstanding scientist, who was one of the giants of the twentieth century in fluid mechanics and other topics, and created the field of Biofluidynamics. Sir James passed away last year in his usual flamboyant style, swimming around an island in the British Channel.

Some world renowned experts in the field are invited to present their work and give special tutorials. The workshop will provide a common stage for the exchange of ideas between specialists from different aspects of Biofluidynamics, namely high and low Reynolds numbers.

The workshop will be an excellent opportunity for researchers in the field to present their work, and for graduate students and postdocs to learn about new advances in the field as well as about research problems that still need to be pursued. We expect this gathering to be of benefit to such young scientists. We plan to invite and give partial support to several young Israeli scientists, as well as several young scientists from abroad.

List of speakers includes: Eshel Ben-Jacob (Tel Aviv), John Blake (Birmingham), Jacob J. Blum (Duke), Alex Braiman (Ben Gurion University), Charles Brokaw (Caltech), Colin Caro (Imperial College), Shay Gueron (Haifa), Mimi Koehl (Berkeley), Nadav Liron (Technion), Stefan Mayer (Denmark), Belinda Orme (Birmingham), Zvi Priel (Ben Gurion University), Jeremy Rayner (Bristol), Sabine Stoecker (Torino), Shegeru Sunada (Tsukubu), Daniel Weihs (Technion), Theodore Y. Wu (Caltech).

Organizers: Shay Gueron, Department of Mathematics, University of Haifa
Nadav Liron, Department of Mathematics, Technion.

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PROGRAM

Tuesday, 4 January

Location: University of Haifa (Rabin Building)

Morning session

09:00-10:00 Registration

10:00-10:15 Opening remarks

10:15-11:15 Plenary talk

John Blake (University of Birmingham, U.K.)

Microbiological fluid mechanics: a tribute to Sir James Lighthill

11:15-12:15 Plenary talk

Alex Braiman (Ben-Gurion University of the Negev, Beer-Sheva)

A stable calcium gradient near the plasma membrane

12:15-12:30



12:30-13:30 Plenary talk

Colin Caro (Imperial College, London)

Vascular fluid dynamics, vascular biology and vascular disease

Afternoon session

15:00-16:00 Plenary talk

Joseph Blum (Duke University, Durham)

Responses of a parasitic protozoan to osmotic stress

16:00-17:00 Plenary talk

Nadav Liron (Technion)

The LGL (Lighthill-Gueron-Liron) Theorem - historical perspective and critique

17:00-17:15



17:15-18:15 Plenary talk

Shay Gueron (University of Haifa)

Unveiling the secrets of ciliary beating and metachronal coordination

18:15-18:45 A tour of Haifa University campus

19:30-20:30 Reception



Wednesday, 5 January
Location: Technion (Room 232)

The Annual Meeting of the Israeli Society for Theoretical and Mathematical Biology


Morning session

09:00-09:30 Registration

09:30-09:45 Greetings

09:45-10:45 Avshalom C. Elitzur (Bar-Ilan University)
Complexity, Information and the Physical Uniqueness of the Living State

10:45-11:45 Eshel Ben Jacob (Tel-Aviv University)
Complex Bacterial Patterning

11:45-12:00 

12:00-13:00 Charles Brokaw (California Institute of Technology)
Axonemal dyneins -- motors for the new millenium

Afternoon session

14:30-15:45 Oral Sessions, posters, round tables etc.

16:00-17:00 Naama Barkay (Weizmann Institute)
Design of cellular computation: examples from bacterial chemotaxis and the circadian rhythm

17:00-18:00 Theodore Yaotsu Wu (California Institute of Technology)
Mathematical biofluidynamics and mechanophysiology of fish locomotion

18:30-19:15 Society forum


19:15-20:15 Adv. Orna Lin (President, Tel Aviv District Bar Association)
The DNA of Abu Kishek

Thursday, 6 January
Location: Technion (Room 814)

Morning session

09:00-10:00 Plenary talk
Charles Brokaw (California Institute of Technology)
Simulating the behavior of sperm flagella in viscous environments

10:00-10:30 Plenary talk
Belinda Orme (University of Birmingham, U.K.)
Chaos and mixing in biological fluids

10:30-11:00 

11:00-12:00 Plenary talk
Mimi Koehl (University of California, Berkeley)
The fluidynamics of hair-bearing appendages that capture molecules or particles

12:00-13:00 Plenary talk
Stefan Mayer (Technical University of Denmark, Lyngby)
A numerical BIEM model of ciliary suspension feeding

Afternoon

13:30 Departure for the Hamat Gader Hotsprings, and banquet




Friday, 7 January

Location: Technion (Room 814)

09:00-10:00 Plenary talk
Danny Weihs (Technion)
Stability and locomotion of rigid bodied fish

10:00-11:00 Plenary talk
Sabine Stocker (Politecnico de Torino)
Optimization of energetic advantages of burst swimming of fish

11:00-11:30 

11:30-12:30 Plenary talk
Shigeru Sunada (Mechanical Engineering Laboratory, Tsukuba)
A new method for explaining the generation of aerodynamic forces in flapping flight

12:30-13:30 Plenary talk
Jeremy Rayner (University of Leeds, U.K.)
Flapping flight aerodynamics, bird energetics and flight behaviour

13:30-14:00 Closing discussion

Saturday, 8 January

07:30 Excursion to Jerusalem

