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|  |  | הטכניון - מכון טכנולוגי לישראל  TECHNION - ISRAEL INSTITUTE OF TECHNOLOGY |
| הפקולטה להנדסה כימית  ע"ש וולפסון |  |  |
| The Wolfson Department of Chemical Engineering |  |  |

**Wolfson Department of Chemical Engineering Seminar**

**Monday, February 6th, 2023 at 15:00**

**Via Zoom:** [**https://mit.zoom.us/j/9451120716**](https://eur01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fmit.zoom.us%2Fj%2F9451120716&data=05%7C01%7Cmichael%40technion.ac.il%7C994e5f310ecc43a454a608db022861a0%7Cf1502c4cee2e411c9715c855f6753b84%7C1%7C0%7C638106144791493606%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=puwADZS6yq0UpXhBEQgrYRQLhStHlBQbqESzndX%2FyZQ%3D&reserved=0)

**Applications of interfacial phenomena: from space telescopes to quantum-inspired computing**

**Valeri Frumkin, Ph.D.**

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In this talk I will present how interfacial phenomena in fluid mechanics can be applied to the development of innovative technologies across a wide range of scales and disciplines.

In the first part of this talk, I will present the Fluidic Shaping method, which relies on surface energy minimization under neutral buoyancy conditions to shape liquid bodies into optical topographies. This method has enabled rapid fabrication of a wide range of freeform optical components with sub-nanometric surface quality, and was recently used to demonstrate the first fabrication of lenses on board the International Space Station. I will also discuss how the inherent scale invariance of the Fluidic Shaping method, made it the underlying technology behind the Fluidic Telescope Experiment (FLUTE) at NASA – a project aimed at exploring the use of fluids for creation of large space telescopes.

In the second part of my talk, I will introduce the field of Hydrodynamic Quantum Analogs, where small droplets placed on the surface of a vibrating fluid bath may propel themselves through a resonant interaction with their own quasi-monochromatic wave field. These “walking droplets” were shown to exhibit many features previously thought to be limited to the microscopic quantum realm. I will present some of my contributions to this new and exciting field, and will discuss my long-term goal of developing a platform that would allow the implementation of quantum-inspired computation based on pilot-wave hydrodynamics.