

CURRICULUM VITAE / BIO

NAME: JACOB N. ISRAELACHVILI, FRS, FAA, NAE, NAS, AAAS

DOB: Born Tel Aviv, Israel, 19 August 1944.

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ACADEMIC RECORD

1965 - 1971 **BA** degree: University of Cambridge (England, UK), Christ's College. Natural Sciences Tripos Part I (Physics): 1st Class. Natural Sciences Tripos Part II (Physics): 1st Class. **PhD** degree: under Prof. David Tabor at the Surface Physics Department, Cavendish Laboratory, University of Cambridge, UK. Thesis title: "Surface Forces".

RESEARCH EXPERIENCE AND POSITIONS HELD

1971 - 1972 **Post doctoral** research, Dept. of Surface Physics, Cavendish Laboratory.

1972 - 1974 **Research Fellow** of the European Molecular Biology Organization (EMBO) at the Biophysics Institute, University of Stockholm, and the Karolinska Institute.

1974 - 1986 **Research Fellow, Fellow, Senior Fellow, Professorial Fellow** – jointly in the Department of Applied Mathematics (Head of Department: 1984-1985) and the Department of Neurobiology, Institute of Advanced Studies, Australian National University (ANU), Canberra, Australia.

1986 - 2016 **Professor** – joint appointments in the Department of Chemical Engineering, Materials Department, Materials Research Laboratory (MRL), and the Biomolecular Science and Engineering (BMSE) Program, University of California Santa Barbara (UCSB), USA.

1993 - 2003 **Associate Director** – Materials Research Laboratory, UCSB.

2016 – present **Research Professor Emeritus** – UCSB (as above)

BIOGRAPHY & RESEARCH ACTIVITIES

Biographical information

Jacob Israelachvili received his BA and MA in (Experimental) Physics from the University of Cambridge, England, and also carried out graduate and postgraduate research work there at the Surface Physics Department of the Cavendish Laboratory. He received his PhD in 1972. After a two-year European Molecular Biology Organization (EMBO) research fellowship at the University of Stockholm, he left for Australia where, from 1974 to 1986, he led an experimental research group devoted to measuring the forces between surfaces. In 1986 he joined the faculty of the University of California at Santa Barbara (UCSB) where he holds joint appointments as Professor in the Chemical Engineering Department, the Materials Department, and the BioMolecular Science and Engineering program. From 1993 to 2003 he was the Associate Director of the Materials Research Laboratory at UCSB.

Research activities

Israelachvili's research is in the general area of intermolecular and inter-surface forces in colloidal, biological, complex fluid and materials systems. He uses the Surface Forces Apparatus (SFA) for directly measuring the forces between surfaces in liquids and vapors, and for studying other interfacial phenomena at the molecular through to the macro scale. Many other techniques are also used. Not only static (i.e., equilibrium) but also dynamic forces are being looked at, such as the 'micro' and 'nano' viscosities of

ultra-thin liquid films (thin film rheology), molecular relaxation processes at surfaces and interfaces, adhesion and friction, lubrication and wear. In particular, Professor Israelachvili is currently studying the very short-range forces between surfaces in liquids and the relation between adhesion, friction, and the conformations of molecules at the surfaces and those trapped between two surfaces. Another area of activity is the development of new experimental techniques, especially for studying dynamic and time-dependent interactions for studying different materials and surfaces such as polymers, gels, inorganic materials, metals, metal oxides, ceramics, biological macromolecules (lipids, proteins, biopolymers, ligands and their receptors) and the interactions (adhesion, fusion and biolubrication) of both model and real biomembranes and biosurfaces (*ex vivo*). Electrochemical reactions are also being studied simultaneously with measurements of the (physical) interaction forces. The aim of these studies is to gain insights into the fundamental interactions in complex fluid, colloidal and biological systems that also have technological applications, for example, for creating biocompatible surfaces, developing new types of structured materials and soft biomaterials, and for the diagnosis of pathological membranes and tissues. As of 1/1/2015 he has published (authored or co-authored) 480 papers, and is the author of a 700-page text-book entitled "Intermolecular and Surface Forces" (3rd Ed. 2011). As of November 2017, the 3rd edition of ISF has been cited more than 29,000 times, and his h-index is 115 [source: *Google Scholar Citations - attached*].

MAJOR AWARDS AND MISCELLANEOUS CAREER HIGHLIGHTS

- 1982 **FAA** (Elected Fellow of the Australian Academy of Science).
- 1984 **David Syme Prize** (shared) awarded for the best original research in biology, physics, chemistry or geology produced in Australia in the previous two years.
- 1985 Publication of 1st edition of "**Intermolecular and Surface Forces**", Academic Press.
- 1986 **Matthew Flinders Lecturer** medallist (Australian Academy of Sciences).
- 1986 Citation analysis of most-cited articles in core journals in Physical Chemistry and Chemical Physics shows that paper No. 23 in publication list (on self-assembly of amphiphiles) was the most cited article in the *Journal of the Chemical Society, Faraday Trans. I*, for the period 1955-1983.
- 1987 **Debye Lecturer** (American Chemical Society): Cornell University.
- 1988 **FRS** (Elected Fellow of the Royal Society of London).
- 1991 **Alpha Chi Sigma Award** for Chemical Engineering Research: AIChE.
- 1993 **Langmuir Lecturer**: American Chemical Society, Chicago.
- 1995 **Arne Brändström Lecture** in Biophysical Chemistry: Chalmers U., Göteborg, Sweden.
- 1996 **NAE** (Elected Foreign Associate of the US National Academy of Engineering).
- 1997 **Faculty Research Lecturer**: UCSB.
- 1999 **Haim Weizmann Memorial Lecturer**, Weizmann Institute, Israel.
- 2003 **Adhesion Society Award** for "excellence in adhesion science".
- 2004 **Probstein Lecturer** in Fluid Dynamics and Microfluidics, MIT.
- 2004 **APS Fellow** (Elected Fellow of the American Physical Society in the area of Biological Physics).
- 2004 **NAS** (Elected to the US National Academy of Science in the area of Engineering Science).
- 2004 **MRS Medal**, awarded for recent work on adhesion and friction.
- 2006 **Honorary Degree of Doctor sc. h. c.** – ETH Zürich.
- 2007 **Honorary Degree of Doctor of Engineering** – University of South Florida
- 2008 Named by the **AIChE** as one of the "One Hundred Chemical Engineers of the Modern Era".
- 2009 **ACS National Award in Colloid and Surface Chemistry**.
- 2011 Publication of 3rd edition of "**Intermolecular and Surface Forces**", Elsevier & Academic Press.
- 2012 **AIChE Walker Award** for Excellence in Contributions to Chemical Engineering Literature.
- 2012 **AAAS** Fellow (Elected Fellow of the American Academy for the Advancement of Science).
- 2013 **Tribology Gold Medal Laureate** (International Institute for Mechanical Engineers).