



The best way to measure how surfaces interact.

The Surface Force Apparatus (SFA)

What is it?

A scientific instrument which measures the interaction forces of two surfaces as they are brought together and retracted. While in contact it can also measure adhesion and friction.

How does it work?

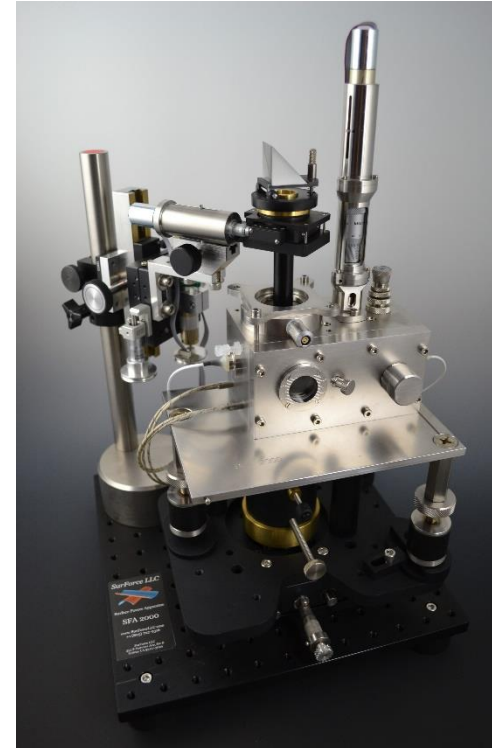
One surface is held by a cantilevered spring, and the deflection of the spring is used to calculate the force being exerted.

Why is it special?

Capable of simultaneous quantitative measurements of both physical (including electrical) and chemical interactions between two surfaces close together from the macro- to the subnano-scale, and under both static and dynamic conditions.

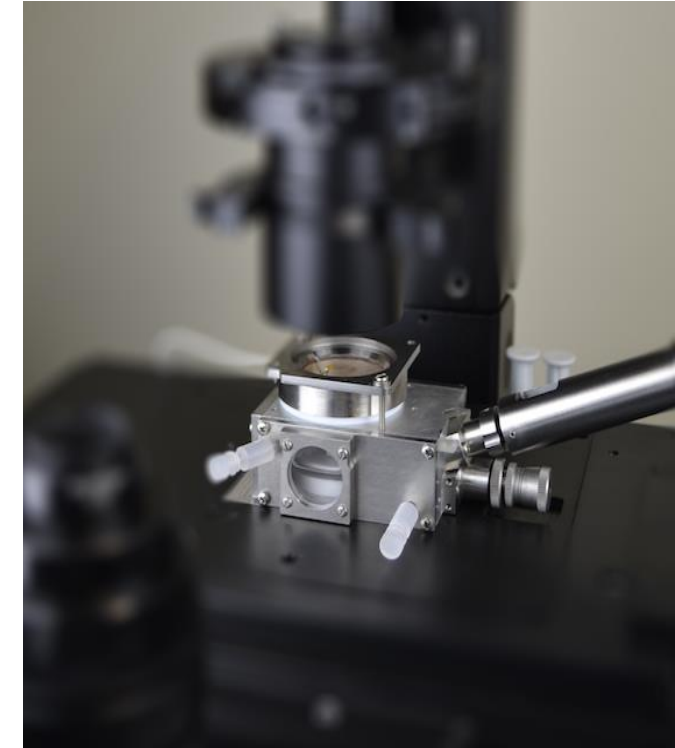
Where is it sold?

There are two versions of the SFA available and ***are only available from SurForce***, a women-owned small business. A full range of attachments and accessories are also available. Each solution can be customized to a user's needs.



SFA 2000

Full featured and configurable.



Micro SFA

More compact and microscope ready.

Research Application Examples

4,000+ scientific research publications utilizing SFA systems!

A range of applications with example:

- **Adhesion** – Stronger Dental Glues
- **Joints and Cartilage** – Understanding Arthritis
- **Lubricants** – More Efficient Engine Oils
- **Polymer Brushes** – Structural Lubrications in Biological Systems
- **Materials** – Increase Concrete Resistance to Wear
- **Resource Extraction** – Improved Oil Recovery Methods
- **Food Science** – Mouth Feel
- **Colloids** – Stable Dispersion of Medications
- **Corrosion** – Increase Durability of Metal
- **Cell Membranes** – Understand Protein Interactions
- **Friction** – Cosmetic Feel

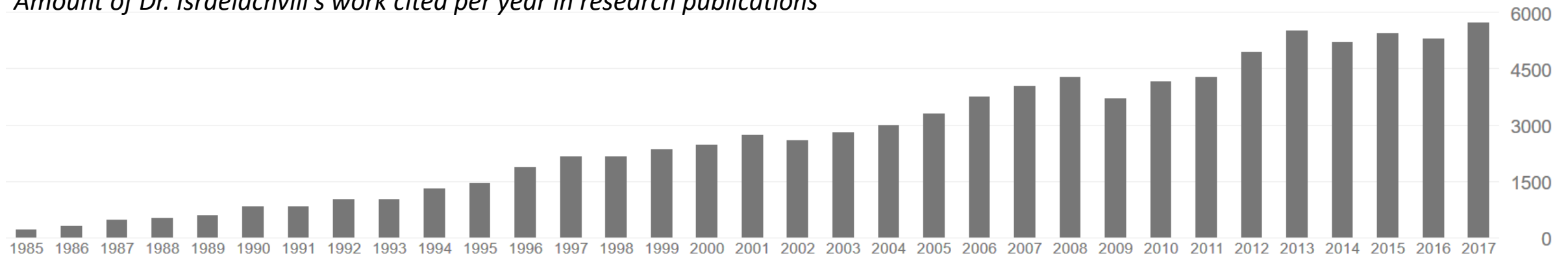


Founded by Dr. Jacob Israelachvili

- PhD in Surface Physics, Cambridge Cavendish Labs
- Research Professor, UCSB
- Author of *Intermolecular and Surface Forces* (the standard reference in the field)
- Numerous Awards in Physics, Chemistry, and Engineering
- Over 97,500 Citations
- Google Scholar H-Index Rank 121
- Global expert in Intermolecular and Surface Forces
- Inventor of the Surface Force Apparatus (SFA)



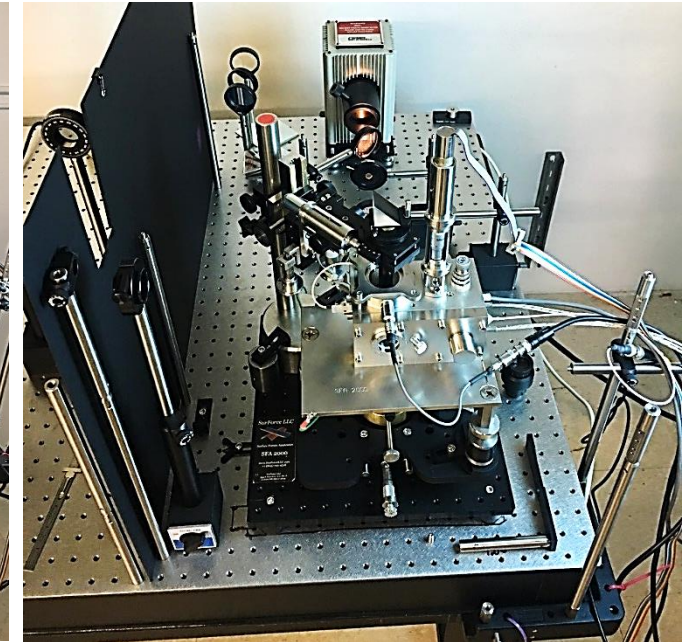
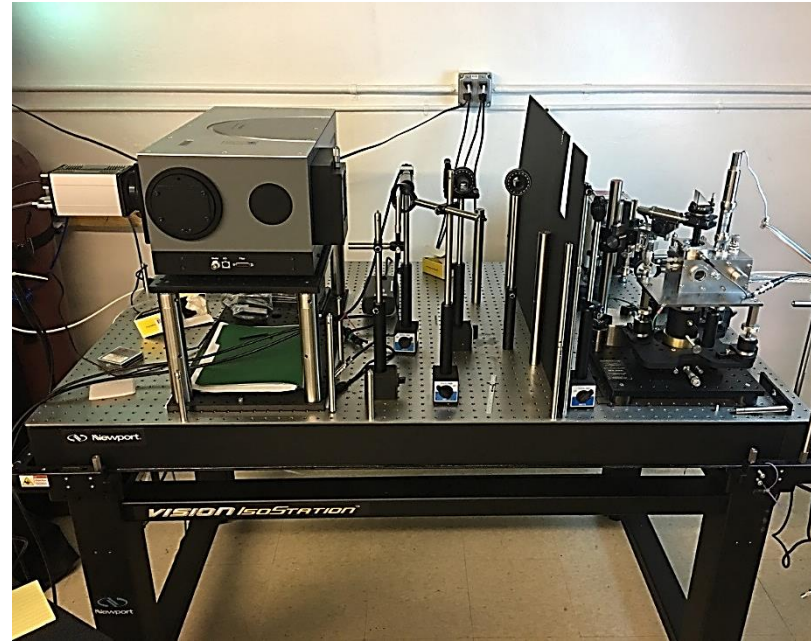
Amount of Dr. Israelachvili's work cited per year in research publications



Research Services by SurForce

Why hire SurForce for research?

- Great introduction to capabilities of the SFA
- Cost effective if human resources/budget isn't achievable for SFA acquisition
- Findings remain private vs. using a UC University which have to be made public
- Access to top SFA researchers in the field
- Short or long term services available based on customer's needs
- Laboratory located in Goleta, CA, USA



Training services also available on-site or at the SurForce lab

Recent Research Featuring the SFA

WINE&VINES

News ▾ Magazine ▾ Buyer's Guide ▾

10.04.2017

Analyzing Wine Mouthfeel Using Tribology

UC Davis researchers study oral surface interactions to understand mouthfeel perception

by Ted Rieger



Researchers Dr. Tonya Kuhl and Dr. Aude Watrelot from the University of California, Davis, are using this Surface Force Apparatus to develop a tribology (physical analytical) method to assess mouthfeel perception of red wines. Photo: Ted Rieger

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More friction for polyelectrolyte brushes

Matthias Ballauff
+ See all authors and affiliations

Science 29 Jun 2018:
Vol. 360, Issue 6396, pp. 1399-1400
DOI: 10.1126/science.aat5343

Article Figures & Data Info & Metrics eLetters PDF

Summary

Skeletal joints must provide lubrication under considerable load. Lubrication between two sliding surfaces in aqueous environments can be greatly enhanced by polyelectrolyte brushes (1): Long macromolecular chains that bear charges at each repeating unit are grafted densely to a planar or curved surface. In the so-called osmotic limit (low salt concentrations), a large fraction of the counterions are confined within the brush layer, thus creating an enormous osmotic pressure (see the figure, left). Surface forces apparatus (SFA) (2) studies revealed a marked repulsion between such surfaces (3), and Klein and co-workers (4) showed that this effect very efficiently lubricates polyelectrolyte brush interfaces. It is now generally believed that lubrication in many biological systems works according to the same principle. On page 1434 of this issue, Yu et al. (5) add a twist to this story by studying the same problem in a SFA and finding that traces of di- and trivalent ions can increase the frictional force between two polyelectrolyte brush layers, dramatically so for Y³⁺ ions.

The Current

SCIENCE + TECHNOLOGY

Glass Matters

UCSB researchers find that the chemical topology of silica can influence the effectiveness of many chemical processes that use it

By Sonia Fernandez

Monday, March 12, 2018 - 10:45 Santa Barbara, CA



[For detailed research reference matrix click here](#)

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Dr. Matthew Tirrell

Founding Director, Dean, Professor

University of Chicago

Molecular Engineering



Dr. Hongbo Zeng

Professor and Research Chair

University of Alberta

*Intermolecular Forces and
Interfacial Science*



Geof Wyatt

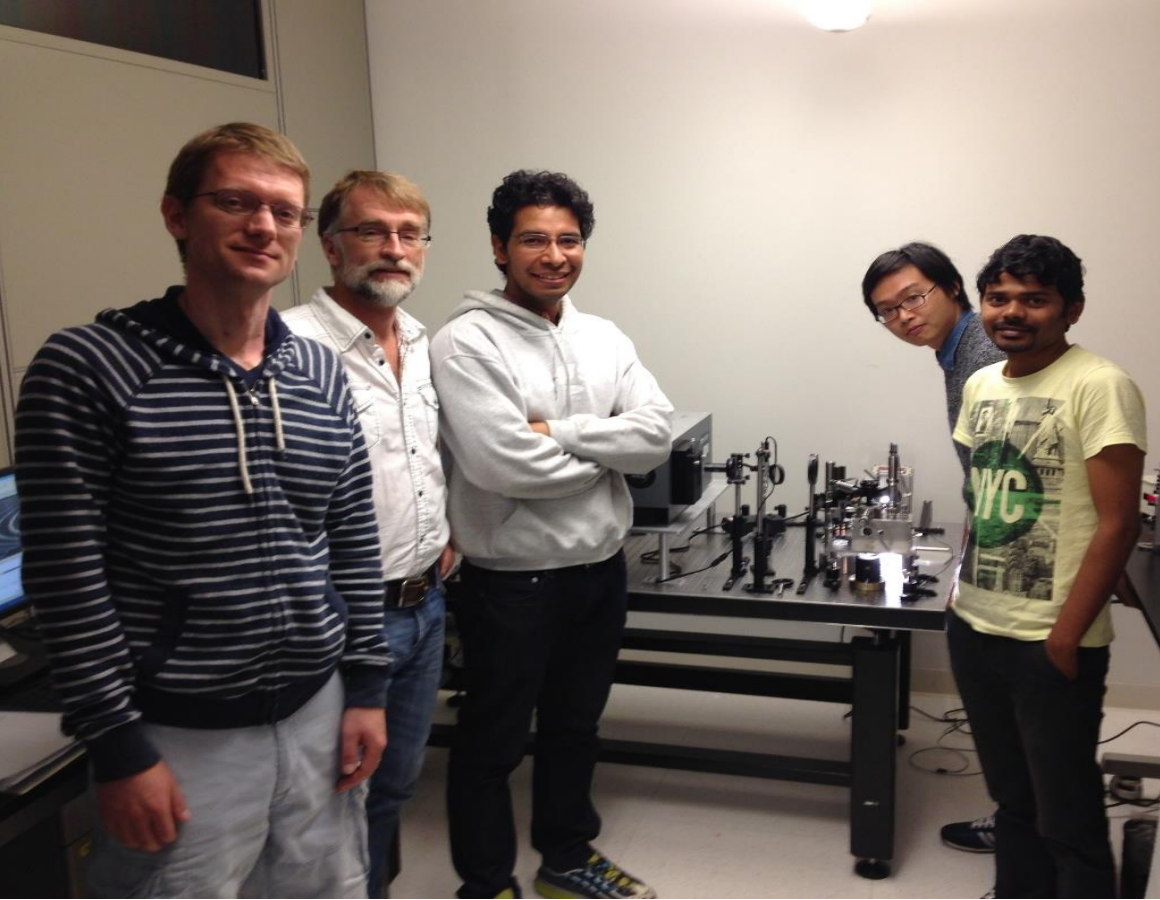
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