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## Antoine Kahn

**Professor of Electrical Engineering**  
**Undergraduate Departmental Representative**

Ph.D., Princeton University, 1978

M.S., Electrical Engineering, Princeton University, 1976

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### Research Areas and Interests

- [Large Area/Flex Electronics for Display/Sensing/Energy Applications](#)
- [Nanoscale Materials/Devices for Sensing and Energy Applications](#)
- [Organic Materials and Devices](#)
- [Physics of Electronic Materials and Nanomaterials](#)

Our research programs center on the electronic, chemical, structural and electrical properties of materials relevant to thin-film electronic devices. My research interests span a range of semiconductor materials (elemental and compounds), but my current research focuses on organic molecular and polymer semiconductors, metals and metal oxides, and dielectrics developed for applications in organic and molecular electronics. Our group is particularly interested in engineering materials and interfaces that improve the performance of organic light-emitting diodes (OLEDs), field effect transistors (OFETs), organic photovoltaic cells (OPVs), and other thin-film devices applicable to large-area, flexible electronics.

The quasi-infinite possibilities for chemical synthesis of new molecular compounds, combined with the unmatched ease of fabrication of organic semiconductor films by vacuum evaporation, liquid processing or printing on a variety of substrates, give organic semiconductors key advantages over other semiconductor materials, and open tremendous opportunities for innovation in device structures. Our research spans fundamental issues of electron-hole interaction in molecular semiconductors; quasi-epitaxial growth of molecular films; chemistry and electronic structure of metal-organic and organic-organic heterojunctions; physics, implementation and impact of chemical (n- and p-) doping to control conductivity and carrier injection.

Our group is involved in extensive collaborations with synthetic chemists, theoreticians, and device physicists in the US, Asia, and Europe, in academia, national laboratories, and industry. Our approach involves a variety of spectroscopic techniques for determining electronic structures, charge carrier transport measurements, morphological and structural tools, and device fabrication.

### Honors and Awards

- Weston Visiting Professorships, Weizmann Institute of Science, Israel (2009-2012)
- Fellow of the American Physical Society (elected, 2002)
- Fellow of the American Vacuum Society (elected, 1999)
- Presidential Young Investigator Award (National Science Foundation), 1984-1989.

### Selected Publications