

## Ferroelectric Photovoltaics

All conventional solar cells use electric field at the interface between two doped semiconductors to drive electrons and holes, generated by absorption of photons of sunlight, in opposite directions which results in solar current. I will present a new concept of conversion of the solar energy into electric current which involves tunneling of photoelectrons through a thin ferroelectric layer deposited on top of pure semiconductor where photoelectrons are generated. Our initial results in Si/(Si-doped hafnia) system showed that electron-hole pairs generated by absorption of light in indirect bandgap semiconductor (Si) were separated by electric field within the ferroelectric layer and formed a photocurrent. Advantages of the next generation solar cells are that doping of semiconductors is not necessary and they can potentially provide larger voltage than the conventional cells based on silicone.