

***You are invited to attend the  
Hilldale Award Lecture  
"Neutrino Expressway Via Madison"***

**VERNON BARGER**

*Vilas Professor of Physics, and  
1999-2000 recipient of the Hilldale Award in the Physical Sciences.*

***Wednesday, March 28, 2001***

***4:00 p.m. to 5:00 p.m.***

***1300 Sterling Hall***

***Reception to Follow***

*Neutrinos are ubiquitous elementary particles whose ghostly nature has been a source of mystery ever since they were proposed in 1930. During this talk, a trillion trillion neutrinos from our Sun will pass unannounced through each member of the audience. The secret to detecting these solar neutrinos—and those from the cosmic "rain," supernovae explosions, reactors, and particle accelerators—is to use huge detectors. Seventy years of neutrino studies have finally produced a big pay-off: We can now count the number of neutrino flavors (three), and we are close to proving that neutrinos have mass. Massive neutrinos undergo quantum mechanical oscillations due to the wave nature of particles. The flavors thereby interchange identities as they travel long distances. Soon a beam of neutrinos will be zipping underground via Madison from the Fermilab accelerator in Illinois to the Soudan mine in Minnesota. Someday beams from neutrino factories will crisscross the Earth. I will discuss what we know about the nature of neutrinos and what we expect to learn.*