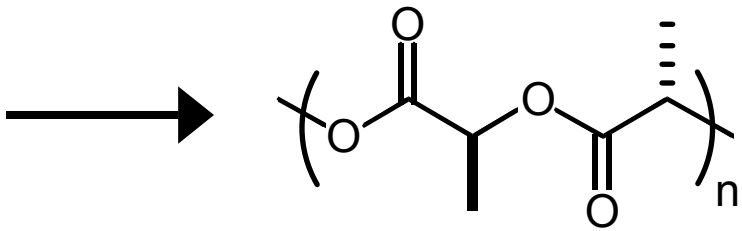
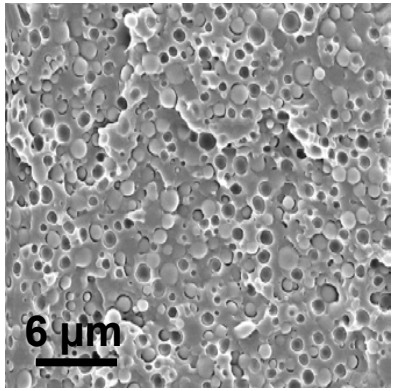
Block Copolymers Containing Renewable Resources

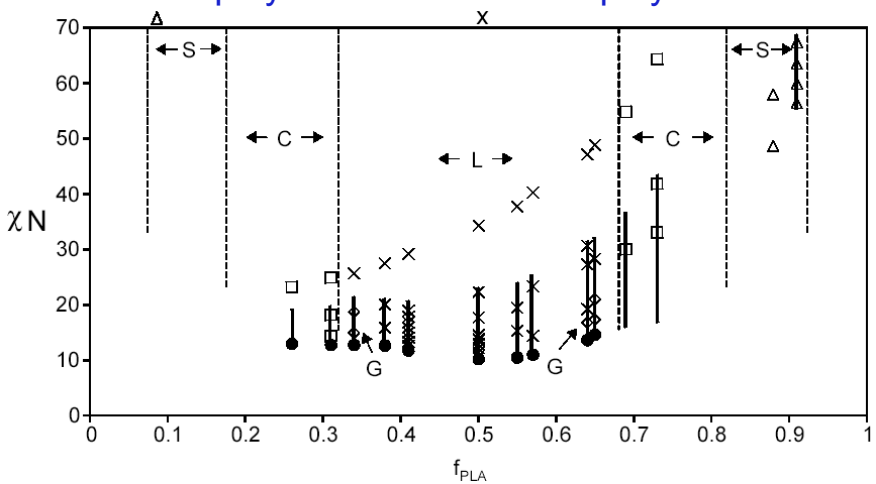


Polylactide (PLA): a commercially produced, renewable resource thermoplastic

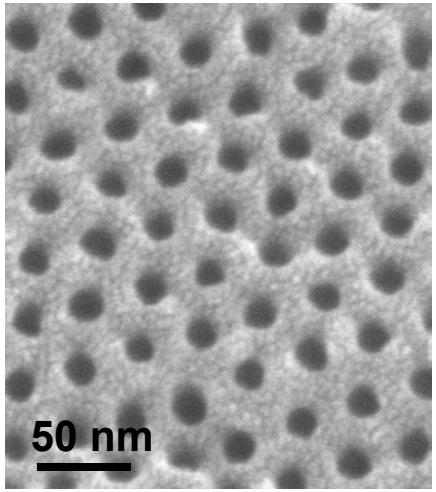
PLA block copolymers as PE/PLA blend compatibilizers



Morphology map for a new polyolefin/PLA block copolymer

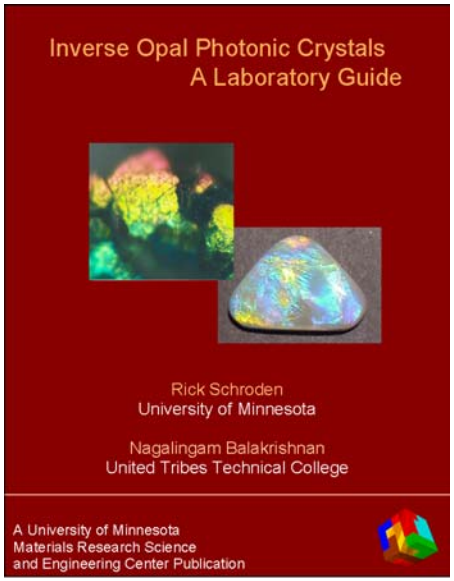


Nanoporous polystyrene from a polystyrene-PLA block copolymer precursor



University of Minnesota MRSEC Native American Outreach

- Faculty-student teams from tribal colleges and Native American Fellowships
- Physics Force shows at Native American schools
- 14% Native American participation (over four years) significantly surpasses national levels
- *Chad Shields* (Sitting Bull College) received summer internship at Dow Chemical, a UMN MRSEC Industrial Partner; now enrolled in Chemical Engineering at University of North Dakota
- *Calvin Birdinground* offered scholarship from Dow for enrollment in Ferris State University
- Direct involvement in curriculum development (Inverse Opal Laboratory Guide)



Bala Nagalingham and Anna Gopher, United Tribes Technical College, with Andreas Stein (MRSEC, 2001) and the Inverse Opal Laboratory Guide co-authored by Nagalingham

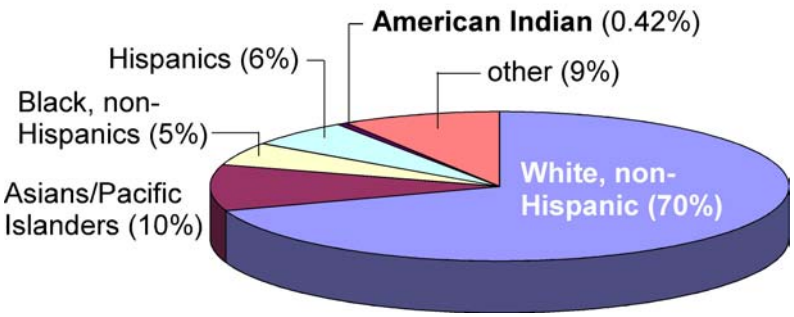
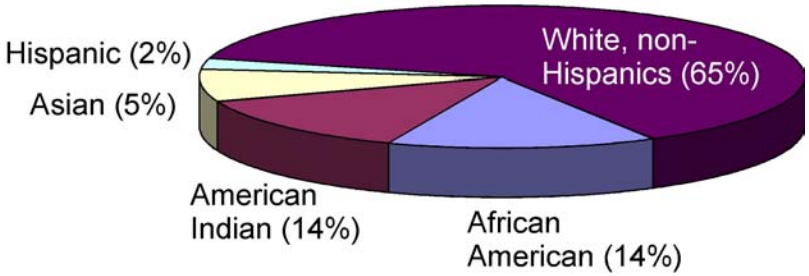
Education and Training

- New generation of environmentally-friendly materials
- Effective collaborations with local industry (*e.g.*, Cargill-Dow)
- Graduate, undergraduate, and high school student training and mentoring

University of Minnesota MRSEC Native American Outreach

- Program designed to address declining enrollment in science and engineering by reaching segments of the U.S. population that are under-represented in science and engineering
- Connecting students to industrial internship opportunities broadens perspectives
- Introduce underutilized concepts to all educational levels, including the various levels existing in tribal colleges
- Increase awareness of science and engineering in all sectors, including the general Native American community
- Involvement with key Native American organizations: *American Indian Science and Engineering Society* and *American Indian Higher Education Consortium*

Bachelor's Degrees Awarded
Physical Sciences/Engineering, 1996 (83,630 total)



MRSEC Summer Students
1999-2002 (83 total)
46% female/54% male