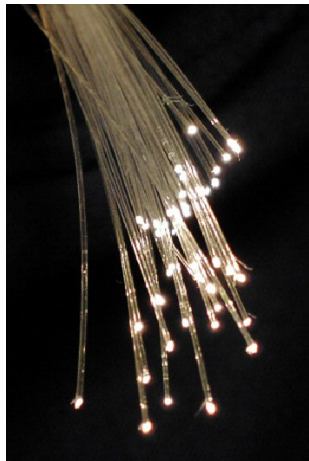


Building an Optical Network

Martha Roseberry

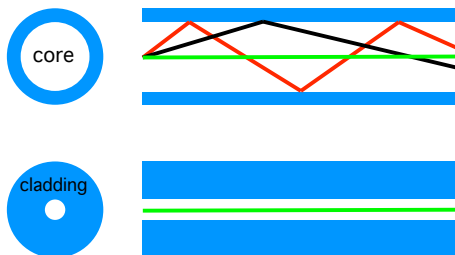
July 1, 2008

Optical Network?



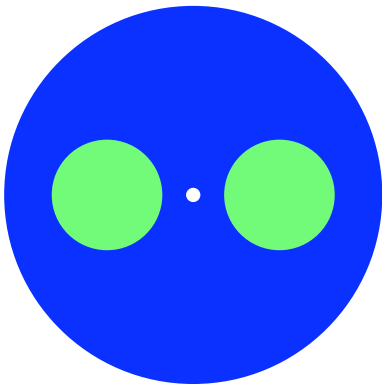
- Use optical fiber and BNC cable to connect Dr. Novikova's lab and Dr. Aubin's lab.
- Allow for the sharing of lasers and instruments, particularly a Ti:sapph laser for which the labs jointly requested funding.
- The Ti:sapph laser cannot be moved between the labs because it is large and sensitive to vibrations.

Types of Fiber



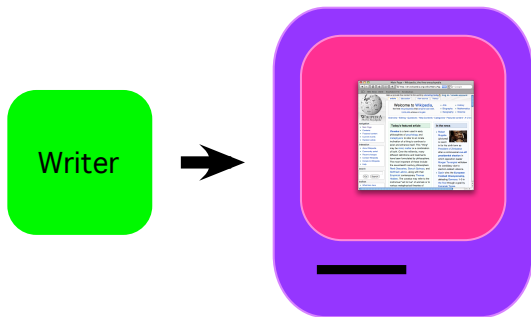
- Multi-mode fibers are much easier to couple to and are cheaper, but the output is dispersed.
- Single-mode fibers output a nice gaussian, but are very difficult to couple to and work for specific light only.

Polarization Maintaining Fiber



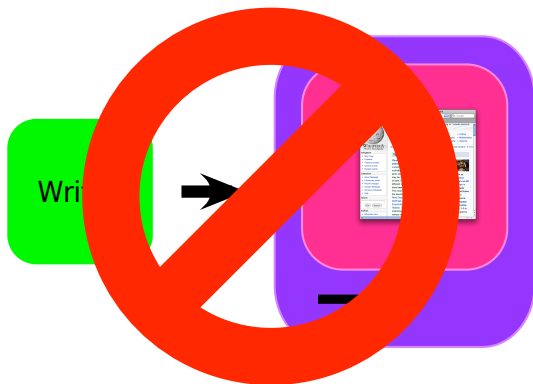
- Maintain the polarization of light as it propagates through the fiber.
- Include rods of a different material to make a non-circular cladding.
- The induced stress on the core gives the core different diameters along its axes.
- Different diameters produce different refractive indices, which maintain the polarization of the light.

DataSocket



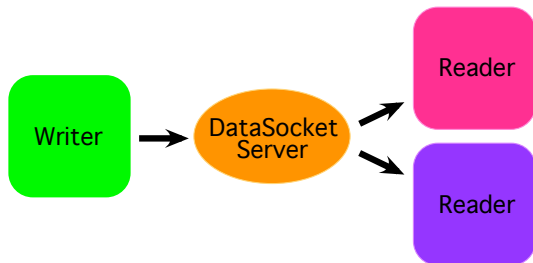
- Attempted to publish an image of the interface to the web.

DataSocket



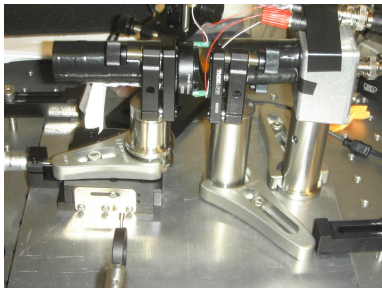
- Attempted to publish an image of the interface to the web. It was really slow.

DataSocket



- To stream wavemeter output between the two labs used LabVIEW and DataSocket.
- Writer updates twice every second, readers update approximately one update behind.

Frequency Comb



- Comb provides a precise method for measuring frequency differences.
- Mode locking the laser produces short pulses which produce the comb.
- Use a Fabry-Perot interferometer to test how broad the comb is.
- Currently the laser is broken, and needs to be replaced.

The End

Questions?