Director de tesis: **Dr. Uladzimir Minkovich**

Sinodales:

Dr. Yury Barmenkov
(Sinodal Interno, Presidente del Jurado)

Dr. Sergio Arturo Calixto Carrera
(Sinodal Interno, Secretario)

Dr. Alexander Kir'yanov
(Sinodal Interno, Vocal)

Tesis: **" DESIGN AND FABRICATION OF SPECIAL PHOTONIC CRYSTAL FIBERS WITH HIGH COUPLING OF THE FUNDAMENTAL MODE TO LEAKY MODES FOR REFRACTIVE INDEX SENSING DEVICES "**

Resumen:

This work explores the possibility of implementing a detection mechanism in optical fibers called "Lossy Mode Resonance" (LMR), which has begun to grow in popularity because, compared to other similar detection mechanisms in the area of optical fibers, has high flexibility with respect to its implementation. By using photonic crystal fibers (PCF) instead of conventional optical fibers, it is possible to obtain improved capacities, which can be controlled by designing the microstructure of the photonic crystal fibers. For this work, 2 photonic crystal fibers (F1 and F2) were manufactured that have 2 rings of air channels, which have a size of davg = 3.31 µm . for F1 and davg = 3.93 µm F2 . Due to this configuration of the fiber microstructure, the evanescent field of the fiber is strongly enhanced and consequently its interaction with the medium external to the fiber makes it a good platform for sensing applications. To implement the Lossy Mode Resonance phenomenon in the photonic crystal fiber, it was necessary to subject the fiber to different conditioning such as tapering and removing part of the fiber coating to use another type of material (in this case polyethyleneimine PEI).