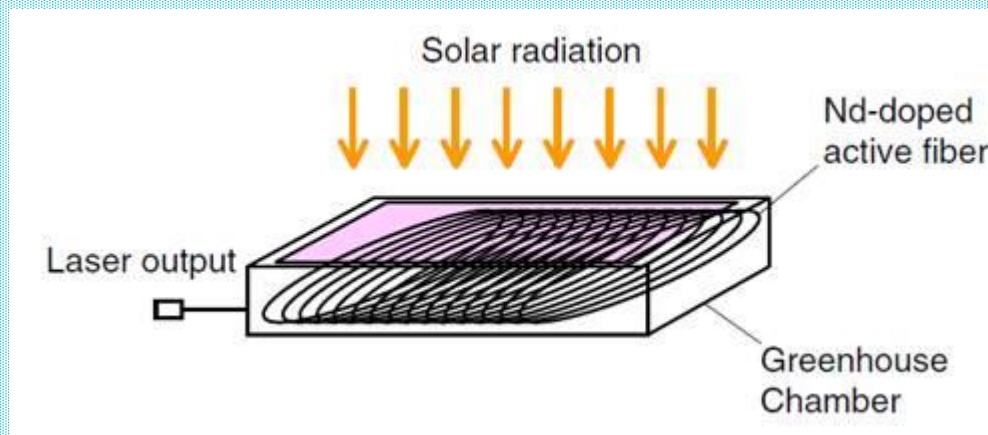


UNB Physics Department Seminar

A solar-powered laser based on the greenhouse effect

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Coherent narrow-band optical emission from solar-powered lasers is actively pursued in the context of renewable energies. The low density and broadband nature of solar radiation usually calls for concentrators to reach the threshold of laser oscillation. Instead of conventional concentrators, I proposed to use a mechanism based on the greenhouse effect to effectively couple sunlight into the active medium. By using a low-loss Nd-doped optical fiber as the active medium, concentrators as well as cooling and sun tracking systems may no longer be needed. I will show that the exquisitely small thermally excited population in the lower level of the laser transition is primarily responsible for the losses at the laser transition despite the medium being a four-level system. This small but measurable absorption from the lower laser level also enables us to obtain more reliable estimate of the emission cross-section of the laser transition than what can be achieved with conventional methods.



Thursday March 28, 2019, 1:15--2:15 pm in P204.
Colloquium tea in P203 beforehand