

# Physics Seminar

Wednesday 2/24/2010, 4:30 pm  
Science & Engineering Building Auditorium

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## **Dimensional Analysis to Lubrication Theory**

Engineering fluid mechanics courses introduce some physics concepts not typically discussed in freshman physics courses, such as dimensional analysis via the Buckingham-Pi theorem, geometric similarity, and the balancing role of inertia, pressure/gravity, and viscous forces in fluid flow. Arrived at by dimensional analysis, the Reynolds number is perhaps the most important parameter in fluid mechanics indicating the importance of inertia relative to viscous forces. The case of low-Reynolds number flows considers motions in which inertia is negligible resulting in a fairly unintuitive reversible flow situation. Lubricating flows take advantage of this low-Reynolds number situation so that pressure increases when the flow is kinematically forced to accelerate into a converging gap due to a driving shear. An introduction to lubrication theory will be presented with a discussion of the possibility of a pressure driven lubricating flow.

*Please join us for light refreshments at 4:15pm outside SEB 203.*