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# Title: **Superlubricity of (PEI/GO)n films in various atmospheres**

**Speaker:** **Mr. Prabakaran Saravanan**
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**Venue:** I$^2$CNER Hall, Ito campus, Kyushu University

**Synopsis**:

The unique frictional behavior of polyethylenimine/graphene oxide layer-by-layer (LbL $(PEI/GO)_n$) solid lubricant coatings on steel substrates in various environments is reported. Different thickness $(PEI/GO)_n$ coatings (where n = 5,10 or 15 is a number of bi-layers) were deposited on steel for macro-tribological comparative study. The tribological results demonstrated the reduction of steady-state friction coefficients by factors of *ca.* 5, 14, 10 and 29 in ambient air, hydrogen, vacuum and nitrogen respectively, compared to the non-coated substrate. The wear lives of thicker coatings (10 and 15 bilayers) were up to 200 times longer than 5 bi-layer film as well as better tribological behavior. Specific friction mechanisms occurring at the top of thicker coatings is believed to be responsible for the superior tribological behavior. Superior frictional behavior observed in dry environments ($H_2$, $N_2$ and vacuum) compared to ambient air is linked to the change in coating response to the environment.

**About the speaker:**

Mr Prabakaran Saravanan is a post-doctoral research associate in the hydrogen materials division at I$^2$CNER. His research interests include tribology (I.e. friction and wear) of carbon materials such as graphene and GO, polymer composites, self-lubricating polymers and coatings for advanced technologies. He obtained his Ph.D., from National university of Singapore, Singapore at May 2015. He is a recipient of TTRF, Japan (Taiho Kogyo Tribology Research Foundation) young tribologist award for his novel idea of developing SU-8 composites for Microsystems applications during his Ph.D. One of his research articles was featured in the reputed **STLE Magazine:** ***Tribology & Lubrication Technology*** as a cutting edge technology. He holds one US patent application and six international journal papers.