Geometry, Groups and Dynamics/GEAR Seminar
(held at the Illinois hub of GEAR)

12:00 pm, Tuesday, September 22, 2015, 345 Altgeld Hall

4-manifolds can be surface bundles over surfaces in many ways

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Abstract: An essential feature of the theory of 3-manifolds fibering over the circle is that they often admit infinitely many distinct structures as a surface bundle. In four dimensions, the situation is much more rigid: a given 4-manifold admits only finitely many fiberings as a surface bundle over a surface. But how many is “finitely many”? Can a 4-manifold possess three or more distinct surface bundle structures? In this talk, we will survey some of the beautiful classical examples of surface bundles over surfaces with multiple fiberings, and discuss some of our own work. This includes a rigidity result showing that a class of surface bundles have no second fiberings whatsoever, as well as the first example of a 4-manifold admitting three distinct surface bundle structures, and our progress on an asymptotic version of the “how many?” question. Time permitting, we will discuss some connections with the homology of the Torelli group, (non)-realization problems a la Nielsen and Morita, and symplectic topology.

Video