Speaker: **Furuta, Mikio**
Title: *Geograpy of spin 4-manifolds with $b_1 > 0$*
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Abstract: It is conjectured that any spin 4-manifold X satisfies the equality $b_2(X)/\sigma(X) \geq 11/8$, where $b_2(X)$ is the second Betti number and $\sigma(X)$ is the signature of X. In this talk I would like to explain the equality could be improved when the intersection form on $H_1(X, \mathbf{Z})$ has some properties.

The main tool is the Seiberg-Witten equation. When the first Betti number $b_1(X)$ is positive, the equation is regarded as a "proper-like" nonlinear map between two Banach bundles over the Jacobian torus. The formal difference of the two Banach bundles is an index of a family of elliptic operators with some symmetry. The outline of the argument is as follows: When the intersection form on $H_1(X, \mathbf{Z})$ is non-trivial, then the index becomes non-trivial. This non-triviality gives a restriction for the existence of the "proper-like" map.