This year's Phillips Lecturer is Professor Yasha Eliashberg of Stanford University. He will be in residence in the department April 17-21. The following is the schedule of his lectures with abstracts. The first lecture will be aimed at a general mathematical audience.

Lecture 1: Tuesday April 18 4:10-5:00 pm B 102 WH

Geometry of contact transformations: orderability vs. squeezing

Gromov's famous non-squeezing theorem states that the standard symplectic ball cannot be symplectically squeezed into any cylinder of smaller radius. An attempt to find an analog of this result in contact geometry brings a surprising answer: while contact non-squeezing phenomenon exists on large scales, it disappears on small scales. It turns out that the contact (non-)squeezing problem is tightly related to the problem of existence of a natural partial order on the universal cover of the contactomorphisms group of a contact manifold. In its turn, the answer to this question surprisingly sensitive to the topology of the contact manifold. For instance, the answer is positive for the standard contact structure on real projective spaces but negative for spheres. This is a joint work with S.S. Kim and L. Polterovich.

Lecture 2: Wednesday April 19 4:10-5:10 pm A 304 WH

Symplectic geometry of affine complex manifolds

Affine, also called Stein complex manifold are basic objects studied in Complex Analysis. On the other hand, Stein manifolds have a canonical built-in symplectic geometry, which is essential for understanding their complex geometry. The problems of existence and of deformation equivalence of Stein manifolds, as well as Morse theoretic problems about plurisubharmonic functions turn out to be purely symplectic geometric questions. Symplectic topology of a Stein manifold, while highly non-trivial, is very unstable, and can be completely understood after multiplication of the manifold by $\mathbb{C}$.

Lecture 3: Thursday April 20 4:10-5:10 pm A 304 WH

Differential equations arising in Symplectic Field Theory

Algebraic structures of Symplectic Field Theory (SFT), a project initiated a few years ago by A. Givental, H. Hofer and the speaker, naturally lead to interesting differential equations which could be viewed as quantized versions of classical integrable hierarchies. For instance, SFT of the circle S^1 provides a quantization of Burgers hierarchy, while SFT for the 3-sphere S^3 leads to a quantized Toda hierarchy.