

Department of Mathematics, BGU

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## OA/OT Seminar

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*On Tuesday, December, 17 2019*

*At 11:00 – 12:00*

*In 101-*

Marina Prokhorova (Technion)

will talk about

### **Family index for self-adjoint elliptic boundary value problems**

Abstract: An index theory for elliptic operators on a closed manifold was developed by Atiyah and Singer. For a family of such operators parametrized by points of a compact space  $X$ , they computed the  $K^0(X)$ -valued analytical index in purely topological terms. An analog of this theory for self-adjoint elliptic operators on closed manifolds was developed by Atiyah, Patodi, and Singer; the analytical index of a family in this case takes values in the  $K^1$  group of a base space.

If a manifold has non-empty boundary, then boundary conditions come into play, and situation becomes much more complicated. The integer-valued index of a single boundary value problem was computed by Atiyah and Bott. This result was recently generalized to  $K^0(X)$ -valued family index by Melo, Schrohe, and Schick. The self-adjoint case, however, remained open.

In the talk I shall present a family index theorem for self-adjoint elliptic operators on a surface with boundary. I compute the  $K^1(X)$ -valued analytical index in terms of the topological data of the family over the boundary. The talk is based on my preprint arXiv:1809.04353.

**Please Note the Unusual Time!**