An algebraic approach to Gelfand duality

Guram Bezhanishvili

New Mexico State University

Joint work with P.J. Morandi and B. Olberding

By the celebrated Gelfand duality, the category **KHaus** of compact Hausdorff spaces is dually equivalent to the category $\mathbf{C^*Alg}$ of commutative (real) C*-algebras. I'll discuss the history and modern account of Gelfand duality. The approach I will present is more algebraic/categorical than analytic. I will show that $\mathbf{C^*Alg}$ forms a full subcategory of the category **bal** of bounded Archimedean ℓ-algebras, and give several algebraic and categorical characterizations of $\mathbf{C^*Alg}$ within **bal**. Among other things, we will see that there is a contravariant adjunction between the categories **bal** and **KHaus** that restricts naturally to Gelfand duality between $\mathbf{C^*Alg}$ and **KHaus**.