**Institut Henri Poincaré**

11 rue Pierre et Marie Curie, 75231 Paris cedex 05

**String Theory in Greater Paris**

**Rencontres Théoriciennes**

**“Supergravité, théorie des cordes et théorie M”**

***Jeudi 17 Septembre 2020, 15:00***

# Anatoly Dymarsky

***U. Kentucky and Skoltech***

## Quantum codes, lattices, and conformal field theories

*There is a deep relation between classical error-correcting codes, Euclidean lattices, and chiral 2d CFTs. We show this relation extends to include quantum codes, Lorentzian lattices, and non-chiral CFTs. The relation to quantum codes provides a simple way to solve modular bootstrap constraints and identify interesting examples of conformal theories. In particular we construct many examples of physically distinct isospectral theories, examples of "would-be" CFT partition function – non-holomorphic functions satisfying all constraints of the modular bootstrap, yet not associated with any known CFT, and find theory with the maximal spectral gap among all Narain CFTs with the central charge c=4. We also discuss averaging over the ensemble of all CFTs associated with quantum codes, and its possible holographic interpretation. The talk is based on arXiv :2009.01236 and arXiv :2009.01244.*

**Institut Henri Poincaré, salle 314, 3ème étage**