Vacuum Catastrophe

Dear Physics Society Members,
We are going to have a talk on cosmological constant problem (Vacuum catastrophe) coming Saturday at 19:15. As far as I know, Cosmological constant problem is the biggest disagreement between experimental observation and theoretical prediction in the whole of Science. History has taught us that Physics thrives on crisis (UV Catastrophe and birth of QM, failure of ether theory and birth of Relativity), so this ridiculous disagreement might also signal new Physics on the corner which is a good motivation for young physicists. The structure of the talk will be:

- Character of Physical Laws
- Brief Introduction to General relativity (Why Einstein called cosmological constant his biggest blunder?)
- How infinities comes in classical and quantum electrodynamics?
- Success of Quantum Field theory
- Vacuum Energy (Casimir effect and Lamb Shift)
- Dark energy and return of Cosmological constant
- Vacuum Catastrophe
- New Physics in Planckian scale

There are several good references in internet. Most popular one is by S. Weinberg https://journals.aps.org/rmp/abstract/10.1103/RevModPhys.61.1. Other good reference might be "QFT in a nutshell by Zee" and "Road to reality by Penrose".

Instead of using heavy mathematics, we will together try to develop a physical intuition of the situation. If time permits, we can also discuss other interesting open problem in condensed physics like "High Temperature Superconductivity".

Best,
Kiran