



# INSTITUT ZA FIZIKU SEMINAR

Institut za fiziku, Bijenička cesta 46,  
predavaonica u zgradi Mladen Paić  
**srijeda, 21. lipnja 2017., u 11:00 sati**

## **Majorana overlaps from critical currents**

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In this talk I will discuss critical currents in phase-biased short superconductor-normal-superconductor (SNS) junctions made of nanowires with strong Rashba spin-orbit coupling.

Firstly, I will give a brief introduction to Majorana physics in condensed matter and its realization and detection in hybrid junctions.

Then, I will show that critical currents offer a powerful tool for probing the emergence of four Majorana bound states (MBSs) in SNS junctions.

They trace the gap inversion, remain finite with a robust feature at the topological transition and, quite remarkably, develop an oscillatory pattern in the topological phase originated from the overlaps between MBSs. I will also discuss that such oscillations are strongly affected by tuning the transmission across the junction, doubling the period of such oscillations in the tunnel regime.

Finally, I will briefly mention the effect of finite temperature on both supercurrents and critical currents.

Voditelji seminara IF-a: [Nataša Vujičić](#) i [Damir Starešinić](#)