ODSEK ZA KOMPLEKSNE SNOVI

Seminar

of the Department of complex matter F7

Thursday, 17.5.2018 at 11:00,

Seminar room F7

Out of equlibrium electronic properites of $ZrTe_5$

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Transition metal pentatelluride, $ZrTe_5$, displays a set of unique and exotic transport properties, which make this material an ideal candidate for magnetic and thermoelectric devices. In particular, the best known anomaly is its resistivity trend, which shows a metallic behavior or a semiconductor behavior, respectively, for temperatures below or above a critical temperature. Several theoretical models have been proposed to interpret this anomaly, based on charge density wave or polaron formation, but with no direct experimental verification.

In this work we report on the temperature dependence of the $ZrTe_5$ valence band, studied at equilibrium and out of equilibrium, by means of time and angle resolved photoemission spectroscopy. Our results unveil the dependence of the band structure across the Fermi level on the sample temperature. By performing temperature dependent experiments, we are able to observe an energy shift of the $ZrTe_5$ valence band. The same effect is observed both by varying the equilibrium sample temperature and by optically exciting the system out-of equilibrium.

Finally, by following the out-of-equilibrium time evolution of the valance band, we report the relaxation times of its position, width and intensity.

The lecture will be held in English.

Cordially invited to attend.