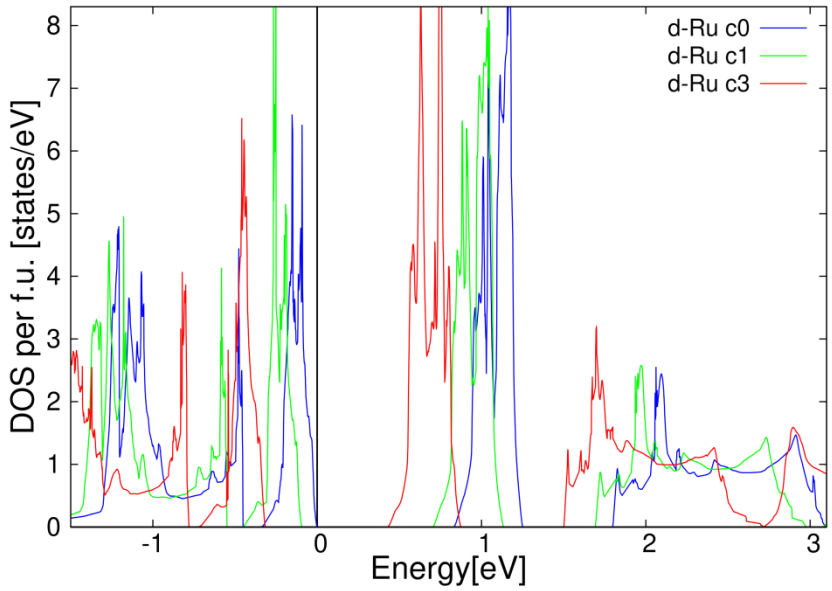
Giuseppe Cuono @ Centro Nazionale delle Ricerche-SPIN, Fisciano (Italy) in December 2022.

From 12.12.2022 until 20.12.2022 I was visiting Dr. Filomena Forte, of the unit of Salerno of the Centro Nazionale delle Ricerche-SPIN, with whom I have a very active collaboration. Dr. Filomena Forte is an expert in the investigation of properties of ruthenates, and with her help I was able to learn a lot about these compounds during this period.

During my stay, I learned how to investigate the structural, electronic and magnetic properties of ruthenates, in particular I investigated Ca_2RuO_4, without and with the application of an external electric field, by means of ab-initio density functional theory. Ca_2RuO_4 presents S- and L-Pbca phases with short and long c lattice constants and with large and small band gaps, respectively. Therefore I analyzed both the phases and in general the compound without and with the application of a tensile strain. In Figure I report an example of density of states of Ca_2RuO_4 in three different structural configurations.

During the training, I had the opportunity to discuss with the members of the CNR-SPIN and I also presented various works that we are carrying out at IFPAN in an internal talk. We continued a collaboration and started new collaborations with other groups, both theoretical and experimental, that should allow us to publish high-impact papers in the near future. We have two projects that we started on Ca_2RuO_4 and other projects on other compounds that will be developed in the coming months.



Density of states of Ca_2RuO_4 in the antiferromagnetic phase of S-Pbca Ca_2RuO_4 for the d-orbitals of Ru in the unstrained case (blue curve), in case of 1% of tensile strain along the c-axis (green curve) and 3% of tensile strain along the c-axis (red curve).