



EINLADUNG zum IFP-SEMINAR

Superconductivity and magnetism in complex mercury-based compounds

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Host: Silke Bühler-Paschen
Termin: Mittwoch, 7. September 2022, 16:00 Uhr CEST
Ort: Institut für Festkörperphysik, TU Wien
Wiedner Hauptstraße 8-10, 1040 Wien
Seminarraum DB gelb 07 (gelber Bereich, 7. OG)

Abstract:

Mercury, in both elemental form and as part of compounds and amalgams has played an important role in solid-state chemistry and condensed matter physics [1-3]. However, much care must be taken both during synthesis as well as during characterization of this peculiar element and its compounds – from toxicity concerns to high chemical reactivity – these systems pose several experimental challenges. In this talk, I will showcase that, nonetheless, mercury-based materials offer unique crystallographic motifs and, as a result, peculiar physical properties [4-6]. In particular, I will concentrate on the binary compounds of mercury and lanthanide as well as actinide elements, which have so far been under investigated. Using a unique laboratory environment, we are able to synthesize single crystals of several binary phases (Figure 1) and study their chemical and physical properties in detail. By looking at the evolution of crystallographic complexity across several series of compounds, I will discuss how intrinsic crystal chemistry affects the resultant ground states.

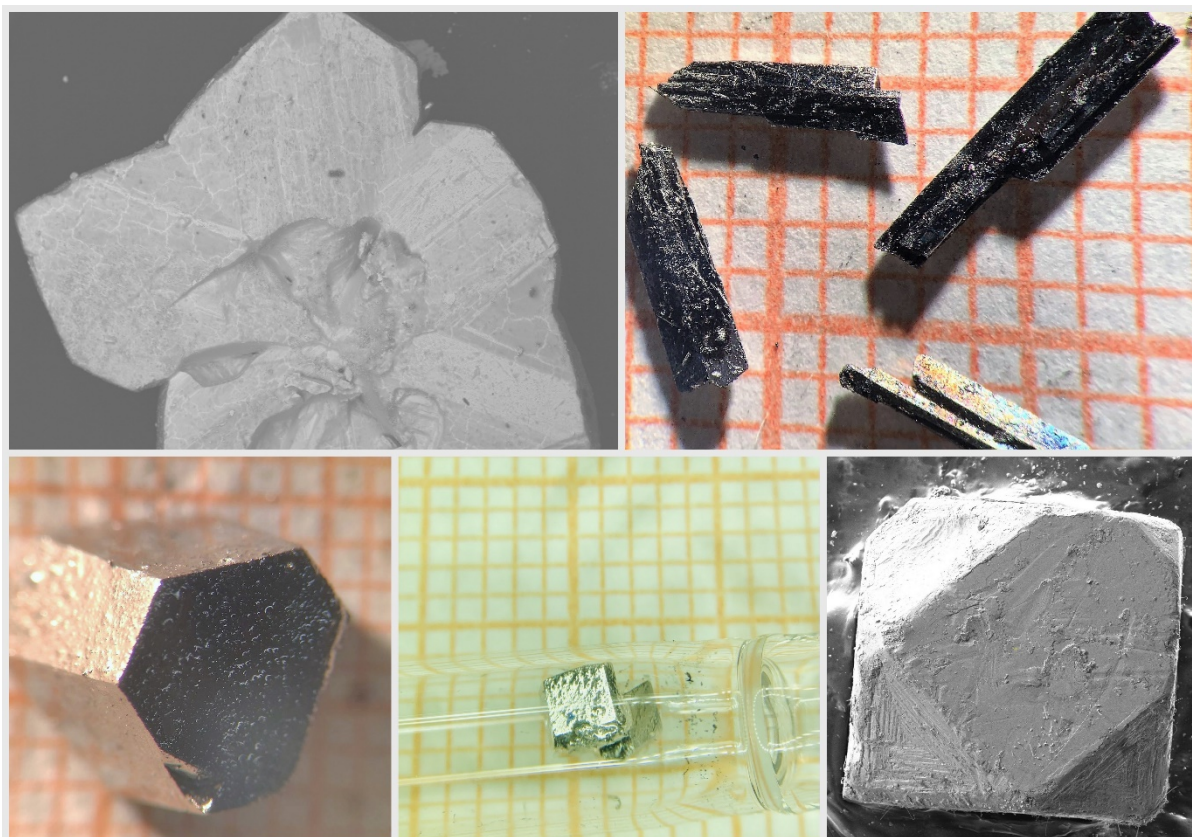


Figure 1: Example of single crystals of mercury-based materials.

References:

- [1] F. Tambornino and C. Hoch, *Zeitschrift Fur Anorg. Und Allg. Chemie* **641**, 537 (2015).
- [2] C. Hoch and A. Simon, *Angew. Chemie Int. Ed.* **51**, 3262 (2012).
- [3] F. Merlo and M. L. Fornasini, *J. Less-Common Met.* **64**, 221 (1979).
- [4] E. Svanidze, A. Amon, R. Borth, Y. Prots, M. Schmidt, M. Nicklas, A. Leithe-Jasper, and Y. Grin, *Phys. Rev. B* **99**, 220403 (2019).
- [5] Y. Prots, M. Krnel, Y. Grin, and E. Svanidze, *Inorg. Chem.* **accepted** (2022).
- [6] Y. Prots, M. Krnel, M. Schmidt, Y. Grin, and E. Svanidze, *Phys. Rev. B* under review (2022)