ISTITUTO DI CHIMICA DEI COMPOSTI ORGANOMETALLICI

Consiglio Nazionale delle Ricerche

Lunedì 19 dicembre 2022

alle ore 15.00

presso AULA 2 dell'Edificio F

Area della Ricerca CNR di Firenze

Via Madonna del Piano 10, Sesto Fiorentino

il Prof. Wojciech Grochala

Center of New Technologies, University of Warsaw,

Zwirki i Wigury 93, 02089 Warsaw

Poland

terrà il seguente seminario:

" Ag fluorides as a replacement for Cu oxides towards high-TC superconductivity"

Si invitano tutti gli interessati a partecipare.

Dr. Andrea Ienco
Primo Ricercatore

Dr. Francesco Vizza
Direttore ICCOM

Short Abstract:

Recent two decades of research on silver(II) fluorides led to realization of their unusual properties, encompassing: marked covalence of Ag–F bonds [1], strong Ag-Ag superexchange [1,2], atypical high pressure phase transitions [3], and close similarity to copper(II) oxides [1,2,3,4] and to $BaBiO_3$ [4] (magnetic/CDW precursors of superconductivity). When properly nanoengineered and doped, Ag(II) fluorides could become superconducting [1] with T_C up to *ca.* 200 K [5]. Novel "chemical capacitor" setup opens a nice route to achieve doping [5,6].

[1] W. Grochala, R. Hoffmann, Angew Chem Int Ed 40(15): 2742 **2001**; J. Gawraczyński et al., PNAS 116(5): 1495 **2019**; W. Grochala et al., ChemPhysChem 4(9): 997 **2003**; N. Bachar et al., Phys Rev Res 4(2): 023108 **2022**.
[2] T. Jaroń et al., Phys Stat Sol RRL 2(2): 71 **2008**; D. Kurzydłowski, W. Grochala, Angew Chem Int Ed 56(34): 10114 **2017**.
[3] A. Grzelak et al., Dalton Trans 46(43): 14742 **2017**; A. Grzelak et al., Inorg Chem 56(23): 14651 **2017**; D. Kurzydłowski et al., Chem Commun 54(73): 10252 **2018**.
[4] M. Derzsi et al., Phys Rev B 105(8): L081113 **2022**; R. Piombo et al., Phys Rev B 106(3): 035142 **2022**.
[5] A. Grzelak et al., Phys Rev Mater 4(8): 084405 **2020**; A. Grzelak et al., Angew Chem Int Ed 60(25): 13892 **2021**.
[6] D. Jezierski et al., Phys Chem Chem Phys 24(26): 15705–15717 **2022**.

Biographic sketch:

Professor Wojciech Grochala's (ur. 1972) career has been linked to the University of Warsaw (M.Sc. 1995, Ph.D. 1998, D.Sc. 2005, prof. extraord. UW 2011, prof. titular 2014, prof. ord. UW 2016). Since 2004 he leads the Laboratory of Technology of Novel Functional Materials. He spent postdoctoral stays in the USA (with Roald Hoffmann, Nobel Prize winner, at Cornell Univ.) and in the UK (with prof. Peter P. Edwards at Univ. of Birmingham). He was visiting professor at Geophysical Lab, Carnegie Institution of Washington and Cornell University. Prof. Grochala coauthors over 200 papers and book chapters as well as 3 international patents. He has promoted twelve PhD and lectured one hundred times at scientific institutes worldwide; he coauthored over two hundred fourty conference contributions. His scientific interests are in materials, inorganic, physical and computational chemistry (particularly for solids) and more recently also organic chemistry. He explores new materials for hydrogen storage, atypical compounds of divalent silver, magnetic materials and compounds of noble gases (particularly the lightest ones). For several years he has been teaching the students of humanities at Artes Liberales College. Growing exotic plants is his hobby, so is prose and poetry writing.

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