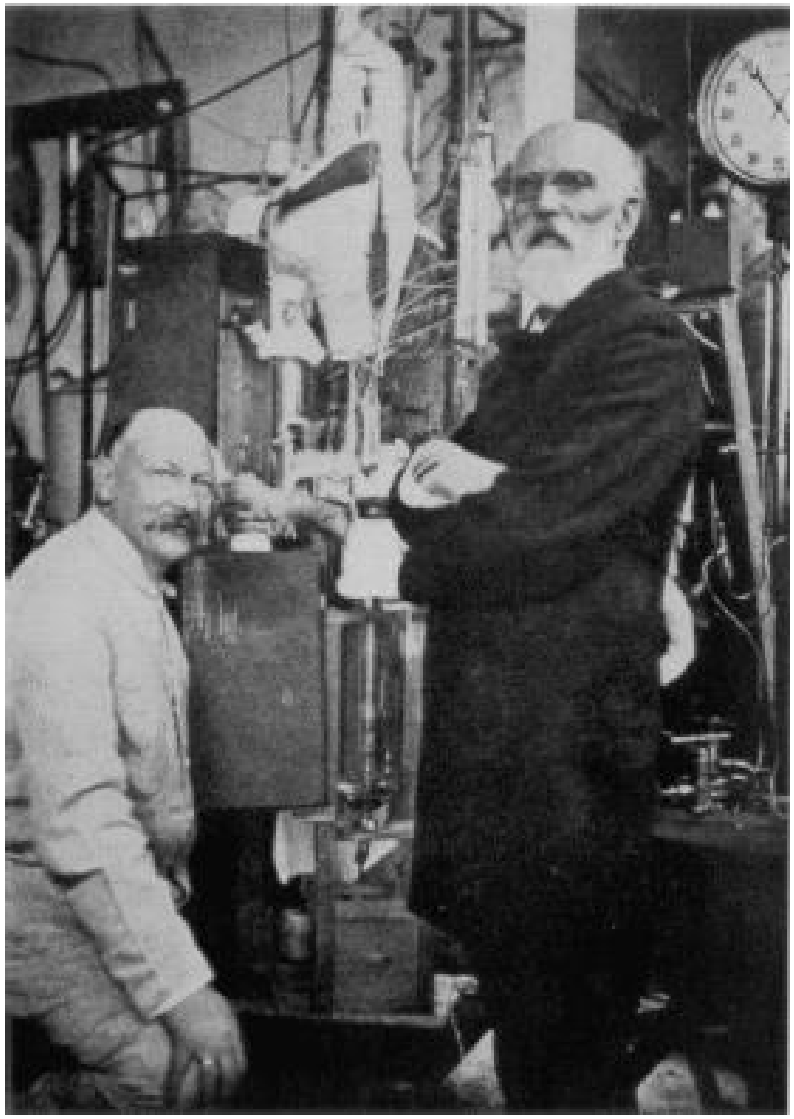
Proprietà a microonde di superconduttori

A. Agliolo Gallitto, M. Li Vigni

1911: la scoperta della superconduttività



La resistenza elettrica del mercurio a 4.2 K si annulla bruscamente.

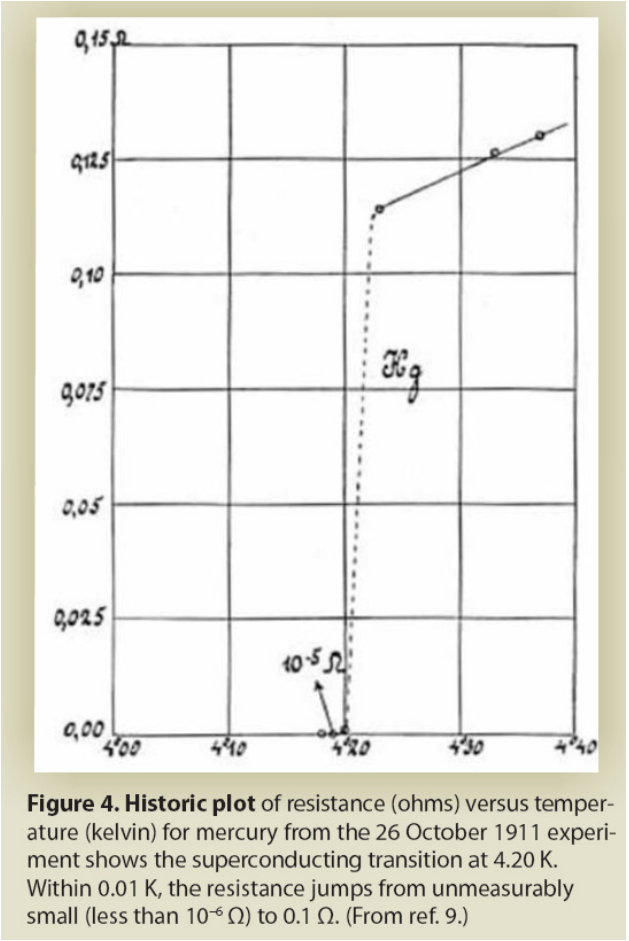
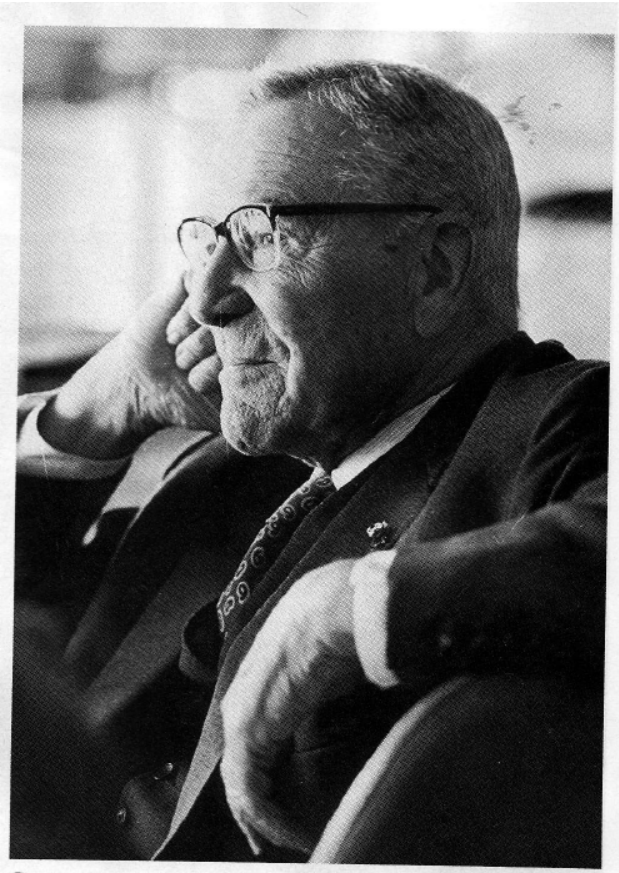


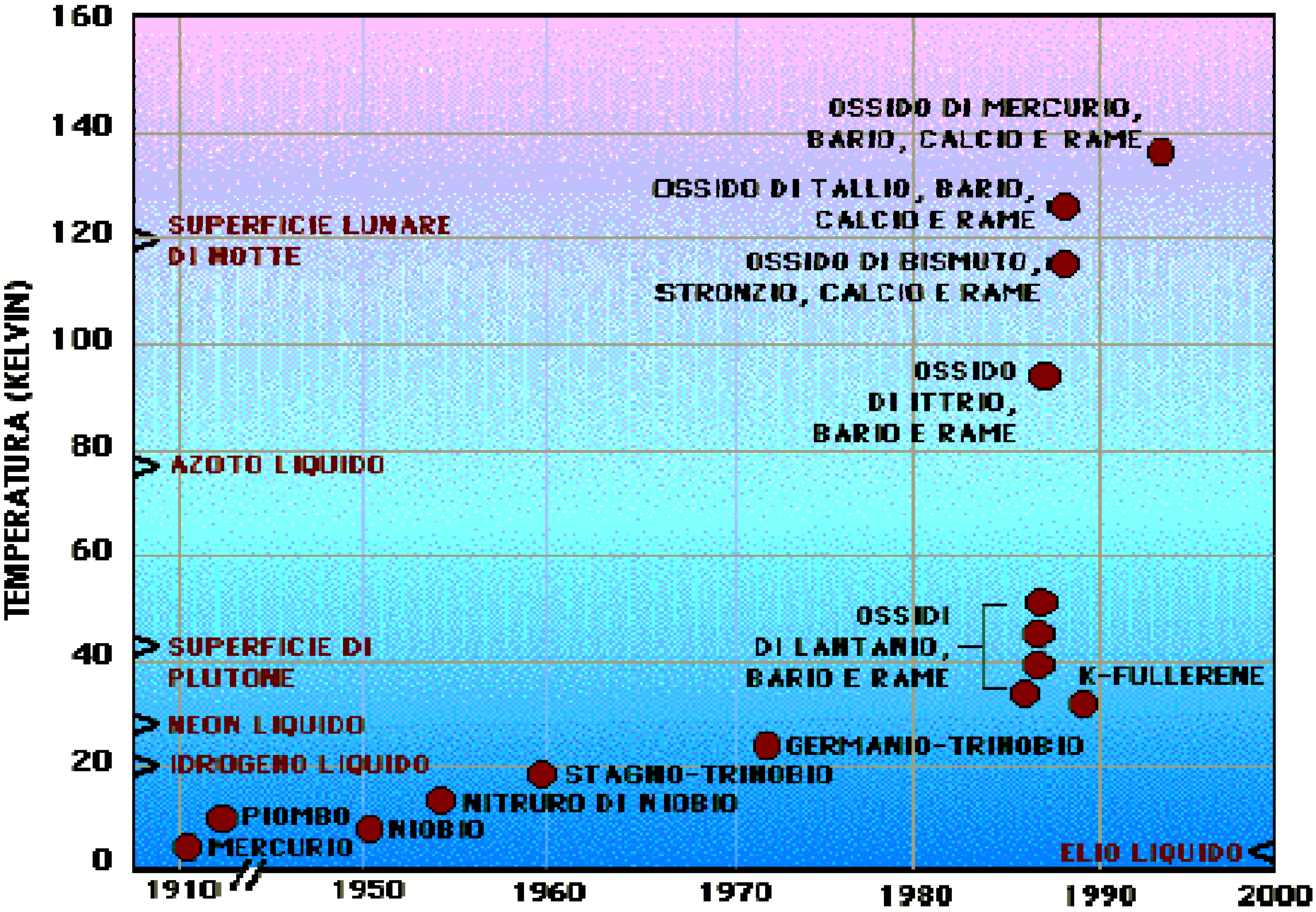
Figure 4. Historic plot of resistance (ohms) versus temperature (kelvin) for mercury from the 26 October 1911 experiment shows the superconducting transition at 4.20 K. Within 0.01 K, the resistance jumps from unmeasurably small (less than 10^{-6} Ω) to 0.1 Ω. (From ref. 9.)



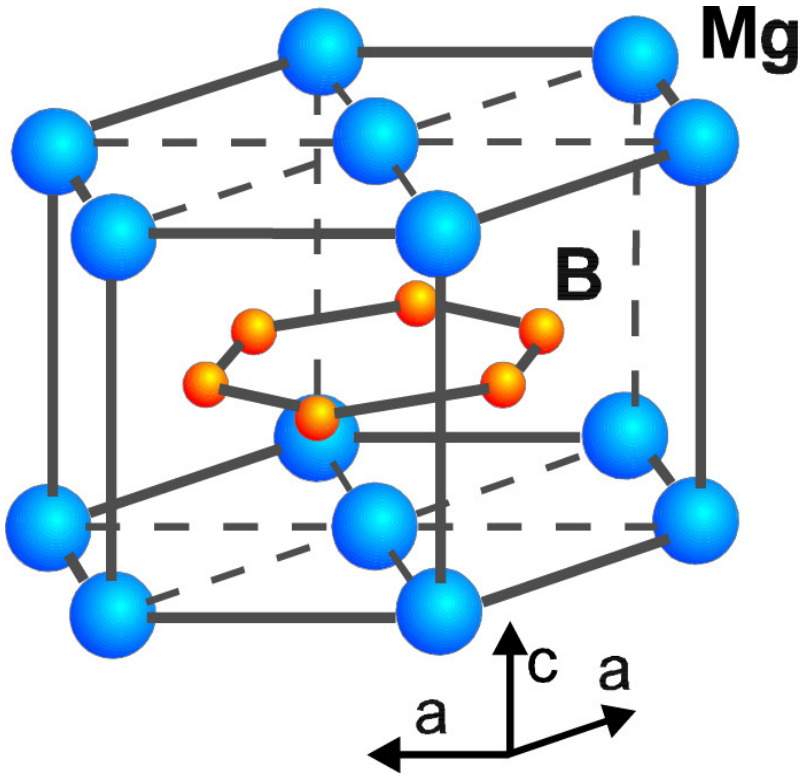
GILLES HOLST, who made the first measurement of superconductivity, later became the first director of the Philips Research Laboratories in Eindhoven.

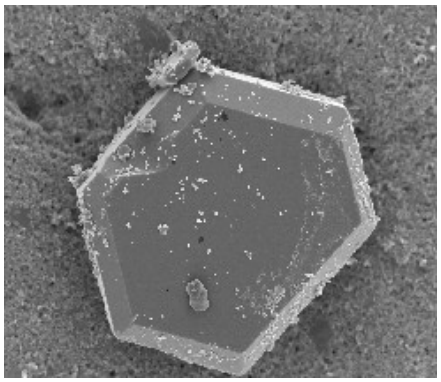
Heike Kammerling Onnes e Johannes Diderik con il primo liquefattore di elio nei laboratori di Leida in Olanda

Andamento di T_c vs. tempo

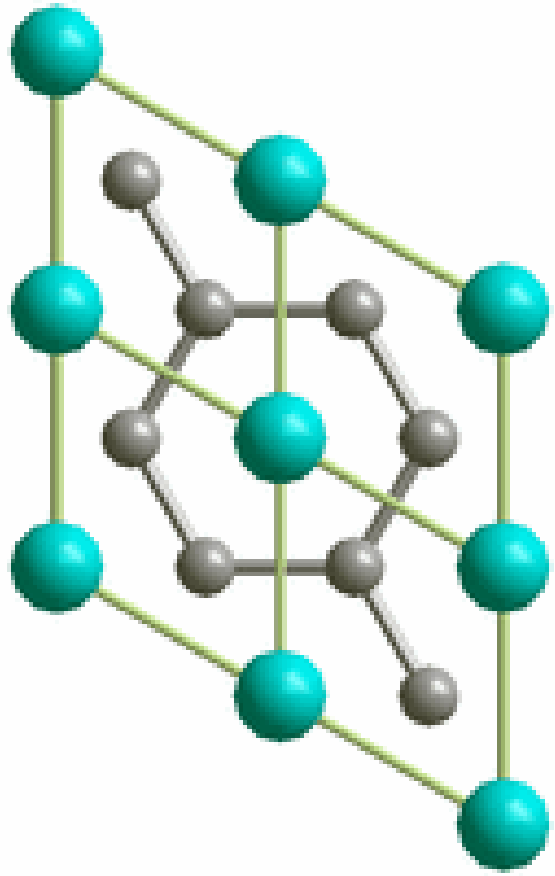


2001: Diboruro di Magnesio MgB_2



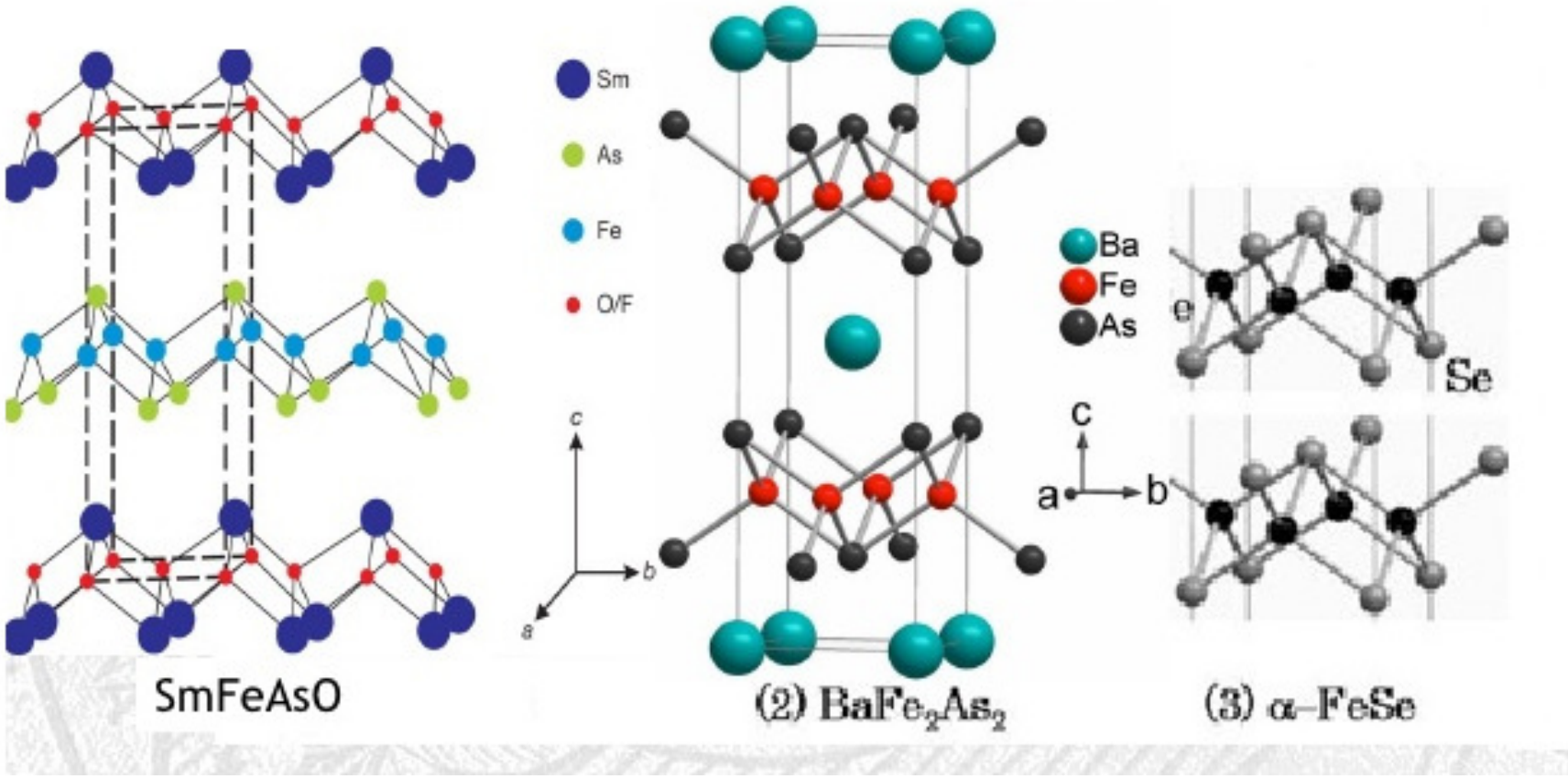


Cristallo di MgB_2 di dimensioni micrometriche



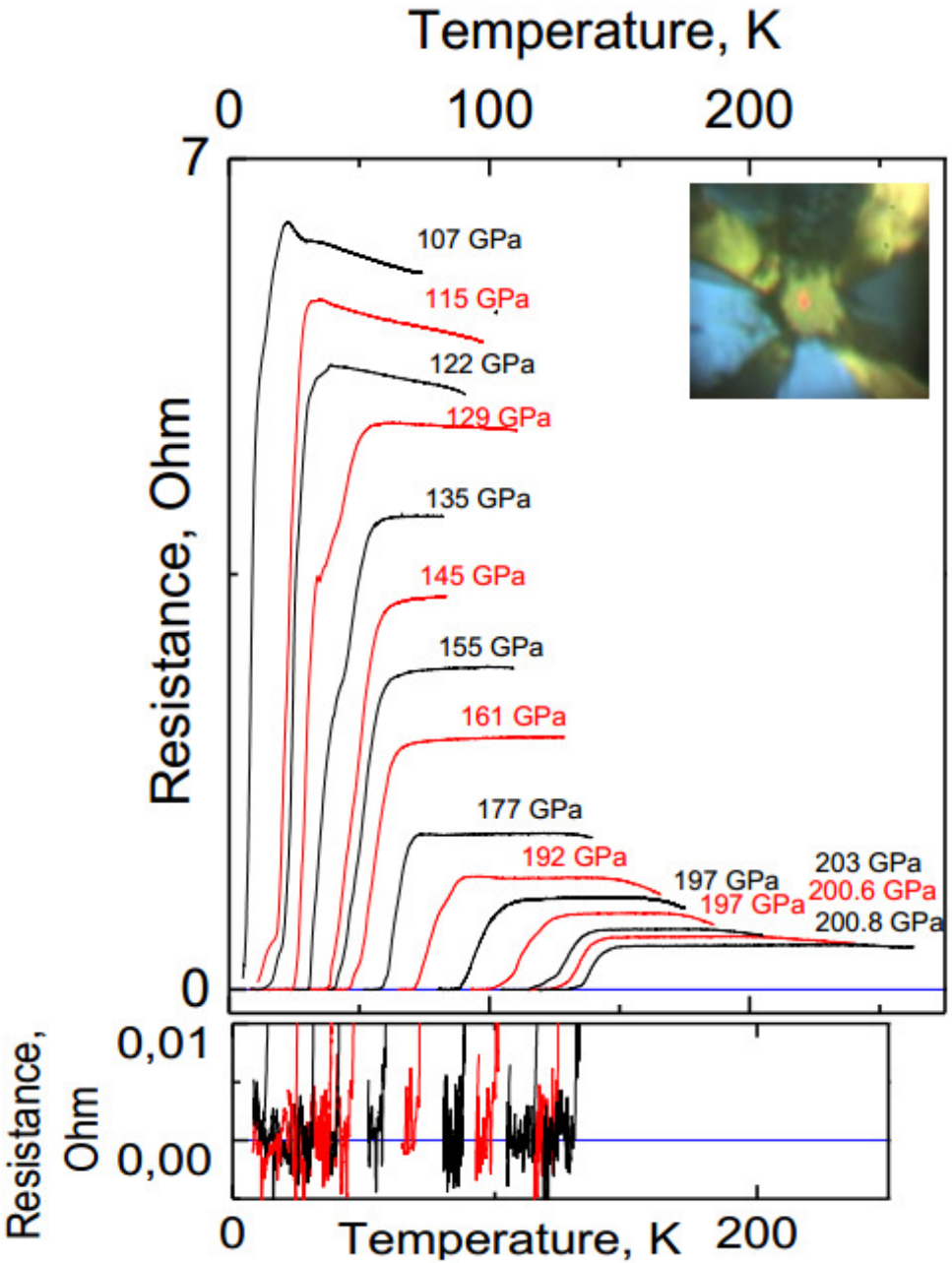
Questo superconduttore è stato scoperto nel 2001 dai giapponesi Nagamutsu, Nagakawa, Muranaka, Zenitani e Akimitsu. Esso ha una temperatura critica $T_c \approx 40$ K.

2008: Ossipnictidi
Superconduttori a base di Fe



I superconduttori di questa famiglia, scoperti a partire dal 2008 dal gruppo giapponese del Prof. Hideo Hosono, mostrano proprietà superconduttive, con temperature critiche fino a $T_c \approx 50$ K, e ordinamento magnetico

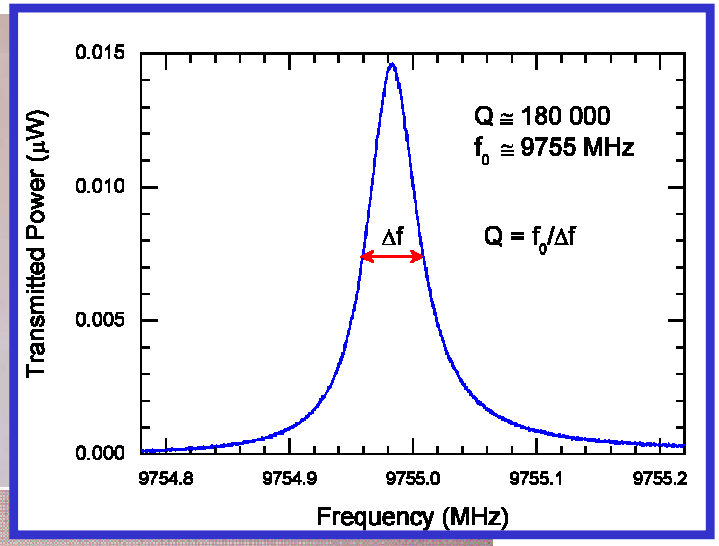
2014: Idruro di Zolfo H_3S

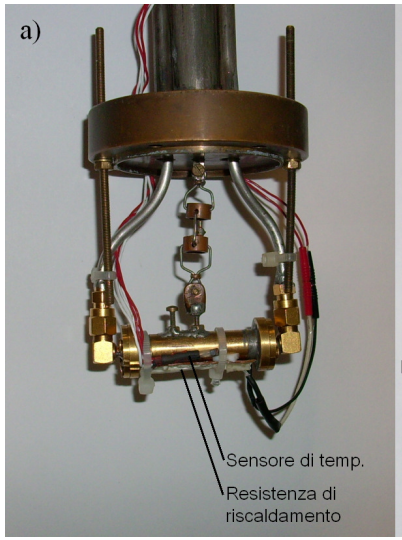


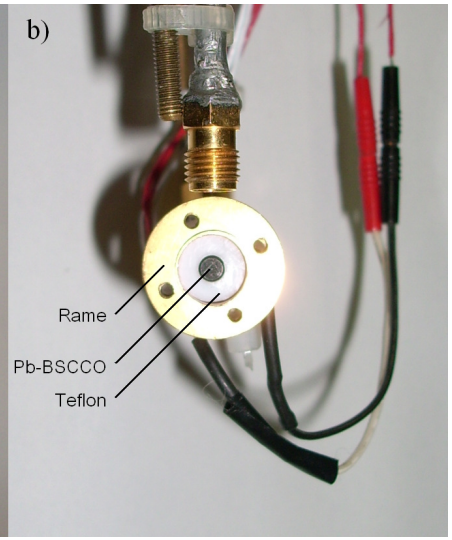
Nel 2014, i ricercatori Drozdov, Eremets e Troyan del Max Planck Institut di Mainz scoprono la supercon-duttività a 190 K nell'Idruro di Zolfo H_3S

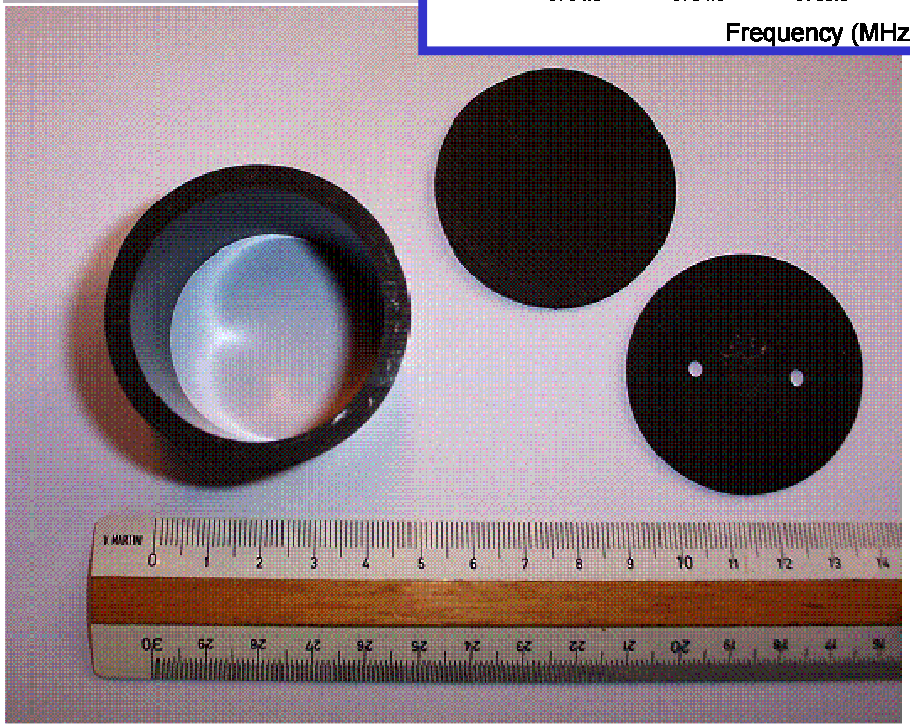
[Nature 525 (2015) 73–76]

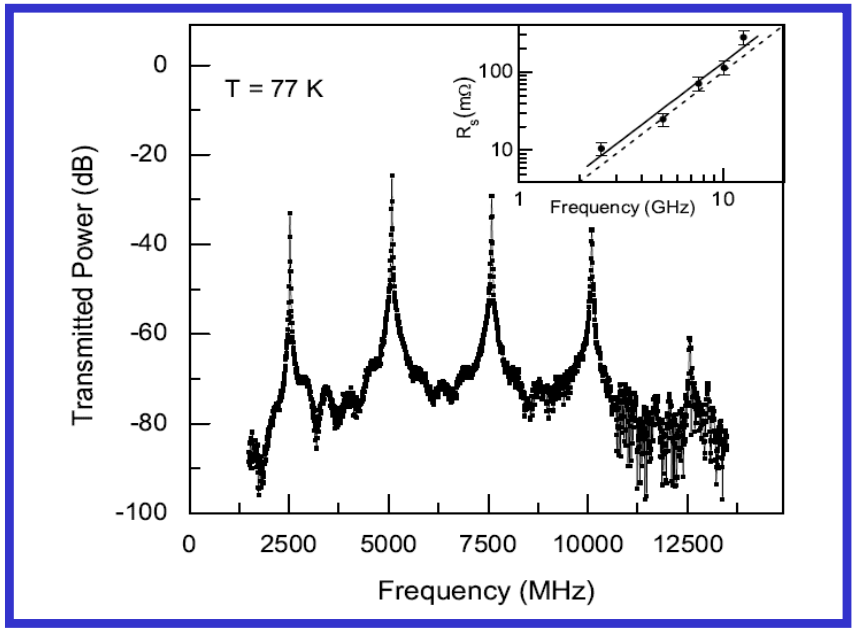
Cavità Risonanti a Microonde di MgB_2 e di Rame con BSCCO







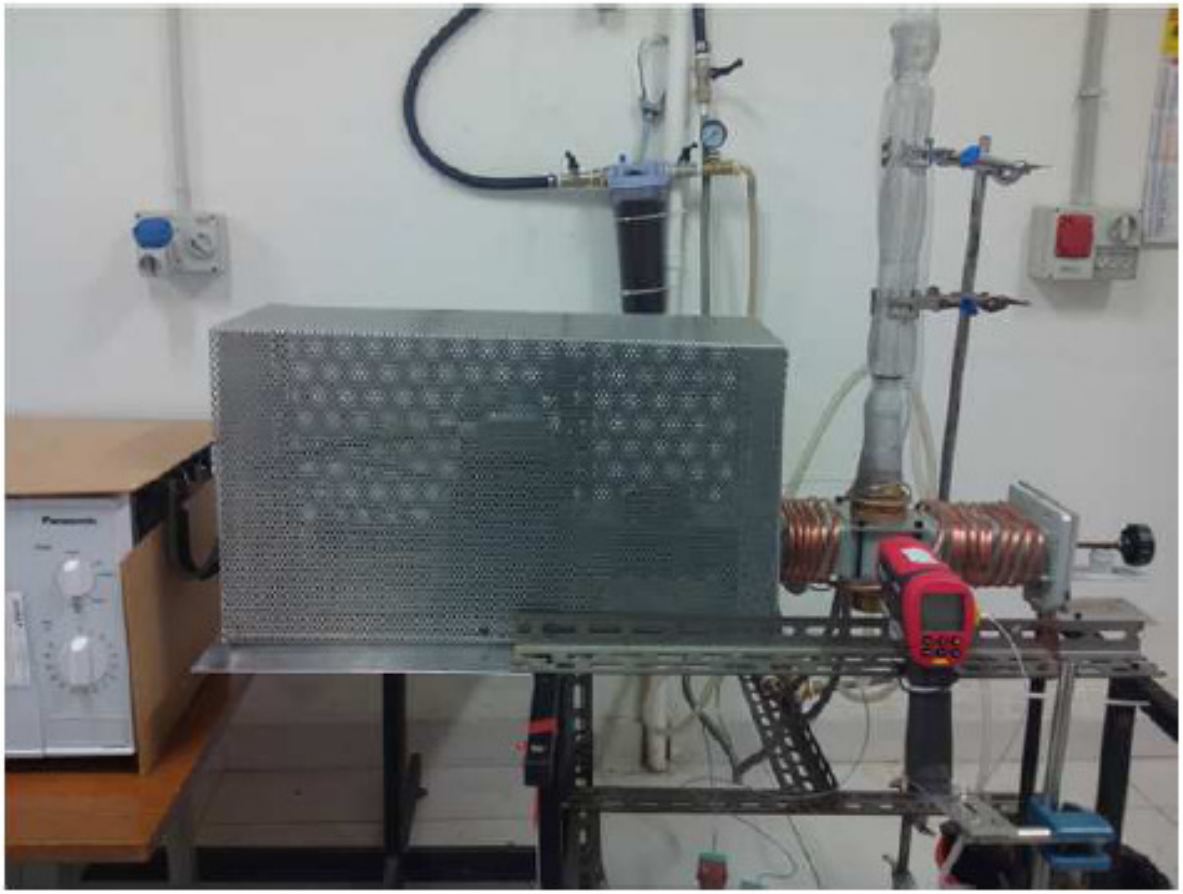




Meeting internazionale sulla superconduttività

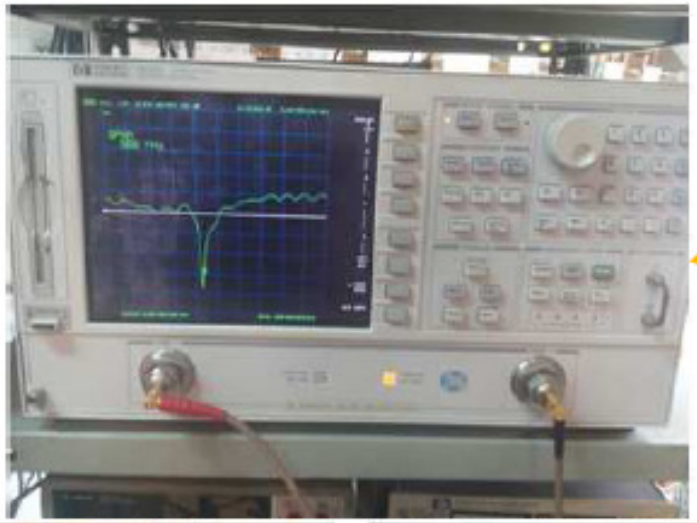
Pirolisi al plasma indotto da microonde

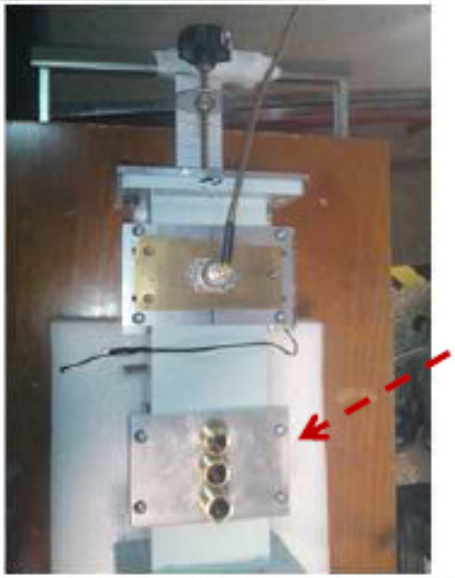
- The high intensity microwave system designed and assembled at *Università degli Studi di Palermo*, Department of Physics and Chemistry.



Controllo e tuning dei componenti a microonde realizzati

- Tuning of the resonant frequencies





Collezione Storica degli Strumenti di Fisica

https://sites.google.com/site/aurelioagliologallitto/collezione-storica

Collaborazioni

- Ing. S. Nicosia, Ing. A. Lanza, Dipartimento di Ingegneria Civile, Ambientale, Aerospaziale e dei Materiali (DICAM), Università di Palermo (Italy)
- M. Bonura, E. Giannini, Department of Applied Physics (GAP) and the Department of Condensed Matter Physics (DPMC), University of Geneva (Switzerland)
- G. Giunchi, A. Figini Albisetti, EDISON SpA R&D Milano (Italy)
- U. Topal, TUBITAK-UME, National Metrology Institute, PK 54, Gebze-Kocaeli, Turkey
- Ş. Yildiz, Department of Physics, Faculty of Science and Arts, Gaziosmanpasa University, Tokat, Turkey
- J. L. Luo, G. F. Chen, N. L. Wang, Beijing National Laboratory for Condensed Matter Physics, Institute of Physics, Chinese Academy of Sciences, Beijing, China
- M. Polichetti, Dipartimento di Fisica "E.Caianiello", Università di Salerno (Italy)
- M. R. Trunin, Yu. A. Nefyodov, D. V. Shovkun, A. F. Shevchun, L. A. Klinkova, N. V. Barkovskii, N. N. Kolesnikov, M. P. Kulakov, Institute of Solid State Physics, Russian Academy of Sciences, Chernogolovka, Moscow, Russia
- G A Ummarino, Dipartimento di Fisica, Politecnico di Torino, Corso Duca degli Abruzzi 24, Torino, Italy