

14.12.2021 FUSUMATECH ANNUAL MEETING

Bruker BioSpin

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R&D Superconducting magnets division

CONTENT

- Bruker Corporation
- Bruker BioSpin
- Bruker Switzerland: R&D Superconducting Magnets division
- NMR products palette
- History of NMR magnets
- Main topics of interest

Bruker Corporation



- Bruker was founded in 1960
- BRKR revenue: ~\$2B
- **R&D investment:**
 ~9% of revenue
- ~75% of revenue from scientific and diagnostic instruments
- ~6,000 employees worldwide

- **Bruker Corporation has 2 segments:**

BEST: superconducting wire business
BEAS, BOST

BSI: BioSpin, CALID, NANO
-> scientific/diagnostic instr.

Bruker Scientific Instruments (BSI) Segment

Three Life Science Tools & Diagnostics (LST & DX) Groups:



BioSpin Group

- NMR/EPR for Life-Science Research & Pharma
- Applied, Industrial & Clinical MR
- Preclinical Imaging
- Services & Life-Cycle Support

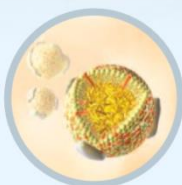
CALID Group

- Mass Spectrometry for
 - Proteomics & Metabolomics
 - Applied & Pharma
 - Microbiology & Pathology
- FT-IR/NIR/Raman for Applied Markets
- CBRNE Detection for Security
- Service, Consumables & Software

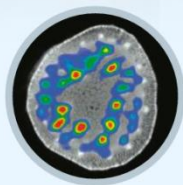
NANO Group

- Atomic Force Microscopy
- Fluorescence Microscopy for Cell Biology & Neurosciences
- X-Ray for Materials Research, QC
- Next-Gen Semicon Metrology
- Service & After-Market business

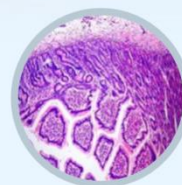
BRUKER HAS #1 OR #2 MARKET POSITION FOR MORE THAN 70% OF ITS PRODUCT PORTFOLIO



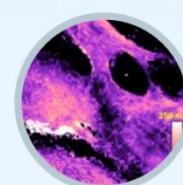
NMR/EPR
& NMR Phenomics



Preclinical Imaging
& MALDI Imaging



MALDI BioTyper



Atomic Force
Microscopy



FT-IR/NIR, X-Ray Diffraction (XRD),
Next-Gen Semicon Metrology



Fällanden, Zürich, Switzerland

- 4 Research and Development Sites
- ~2,200 employees worldwide
- BBIO produces its own magnets



Wissembourg, France



Karlsruhe (Ettlingen-Rheinstetten), Germany

- **NMR, MRI, EPR, TD-NMR**



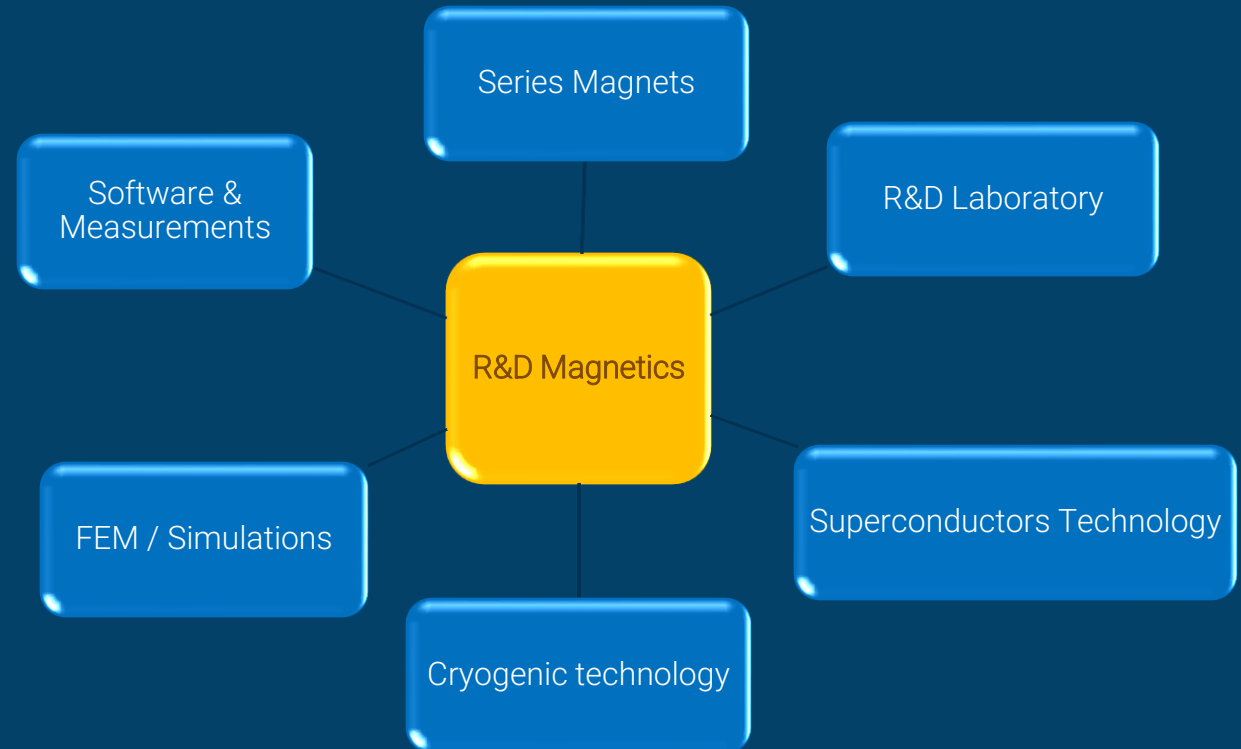
Billerica, United States

Bruker Switzerland (BioSpin)



~ 550 employees

Development: 30%



Bruker BioSpin NMR product palette



Bruker NMR magnets, from 300 – 1200 MHz (from 7.0 T to 28.2 T)

Proton ^1H magnetic resonance frequency 100 MHz \leftrightarrow field of 2.35 T



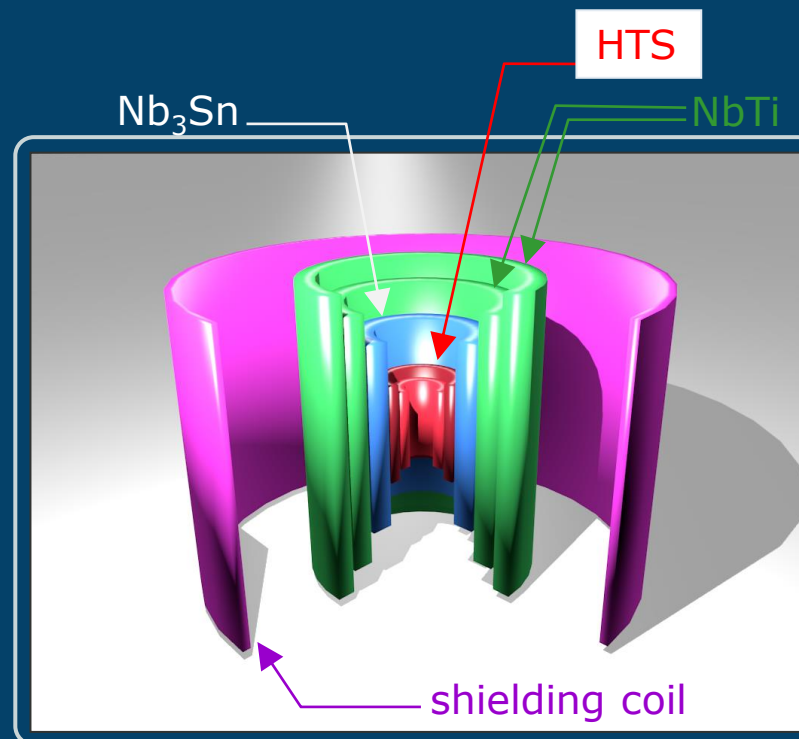
300 – 800 MHz



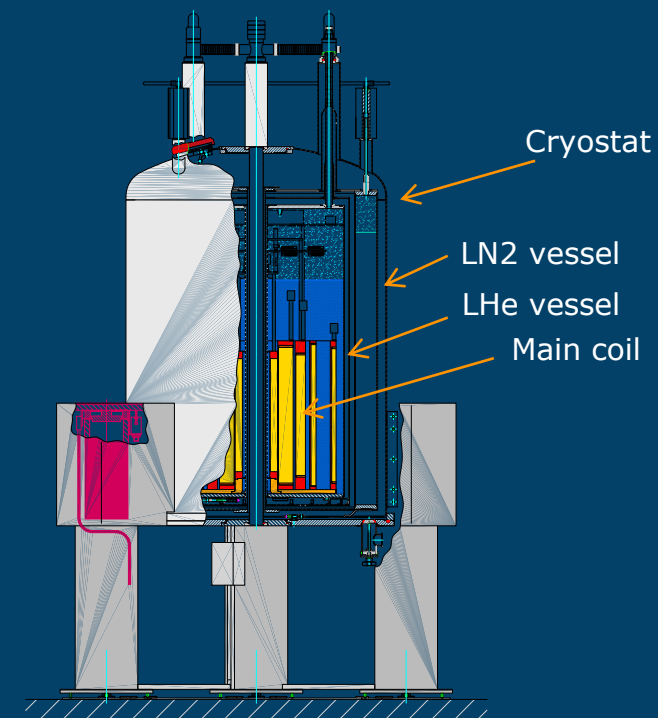
800 – 1200 MHz

NMR magnets

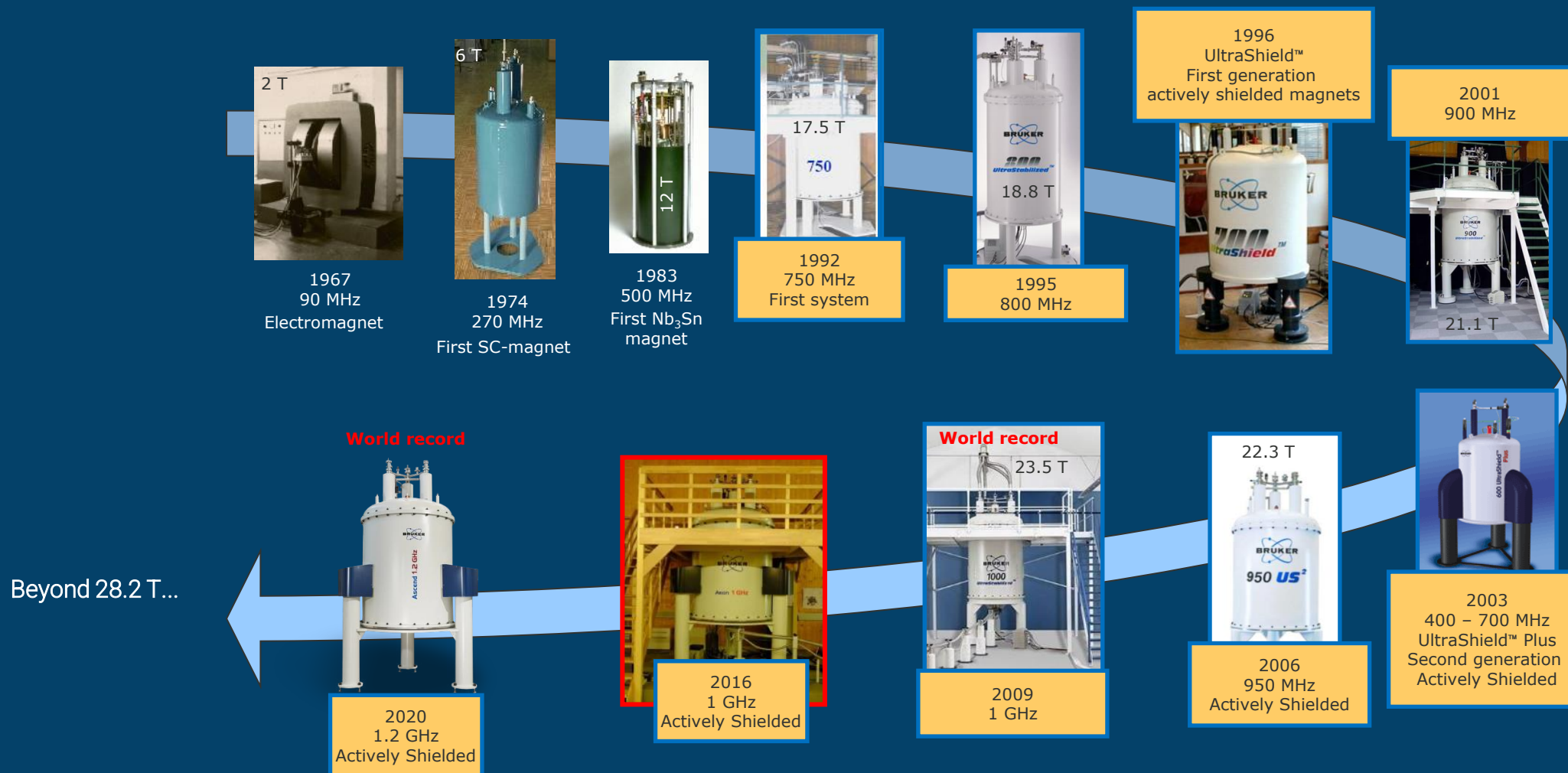
Material	T_c @ $B = 0$ T	B_c @ $T = 4.2$ K
NbTi	9.3 K	10.5 T
Nb ₃ Sn	18.2 K	21.5 T
HTS	93 – 110 K	> 100 T



Layout of an UHF solenoid magnet



Bruker BioSpin: history of NMR Magnets



Questions?

