Applied Superconductivity Laboratory

Faculty advisor: Prof. Seungyong Hahn

APPLIED SUPERCONDUCTIVITY LABORATORY

Office : 301, 608, Tel: +82-02-880-1496 (KR),
E-mail: hahnsy@snu.ac.kr

- Prof., Dept. of Elec. Eng., Seoul National University (2020 – Present)
- Assoc. Prof., Dept. of Elec. Eng., Seoul National University (2017 – 2020)
- Assoc. Prof., Dept. of Mech. Eng., Florida State University (2015 – 2017)
- NI-REBCO Team Leader, National High Magnetic Field Laboratory (2015 – 2017)
- Principal Investigator, Francis Bitter Magnet Lab., MIT (2008 – 2015)
- Research Engineer, Francis Bitter Magnet Lab., MIT (2006 – 2015)
- Post-doctoral Associate, Francis Bitter Magnet Lab., MIT (2003 – 2005)
- BS (1998), MS (2000), PhD (2003), all in EECS, Seoul National University

Research Themes

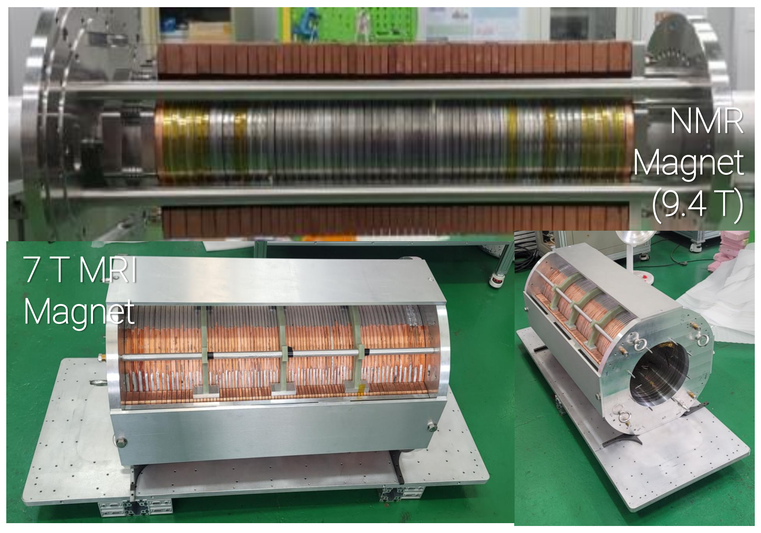
1. Key Technical Merits of Superconductivity
   - Large current carrying capacity (>1000 times than that of copper)
   - Capability to generate a magnetic field of ≫ 10 T
2. Main Research Goal: Application of superconducting technologies to (1) large power and (2) high field systems

Power Applications

- Superconducting Magnetic Energy Storage
- Superconducting Power Cable
- Superconducting Fault Current Limiter

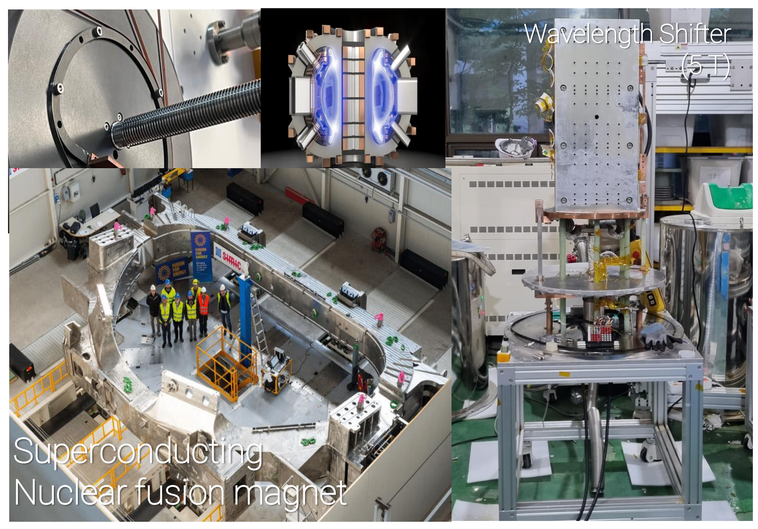
Biomedical Applications

- Magnetic Resonance Imaging (MRI)
- Nuclear Magnetic Resonance (NMR)
- Proton Therapy



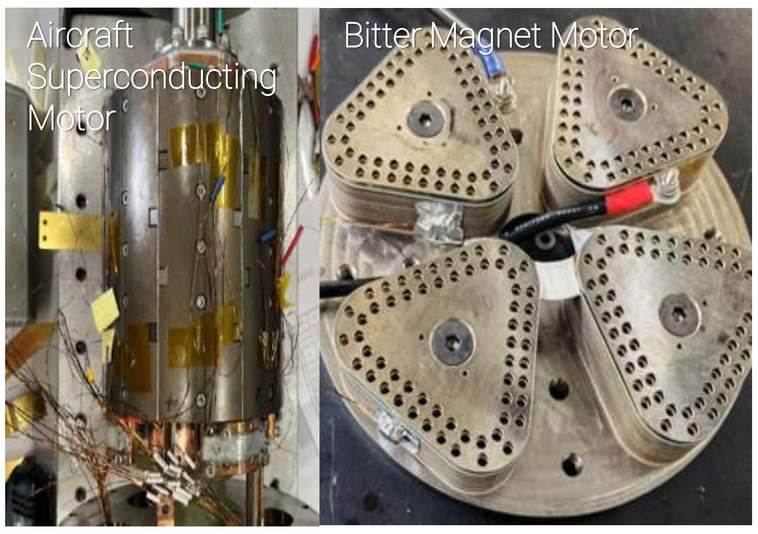
Large Scale Science

- Fusion Energy Reactor
- Heavy Ion Accelerator
- Dark Matter Detector



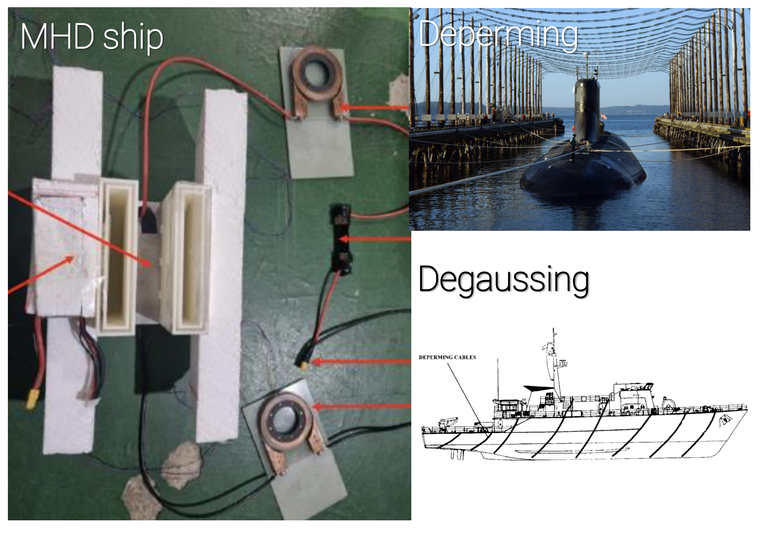
e-Transportation

- Aircraft Motor
- Hydrogen Truck Motor
- Ship Propulsion Motor



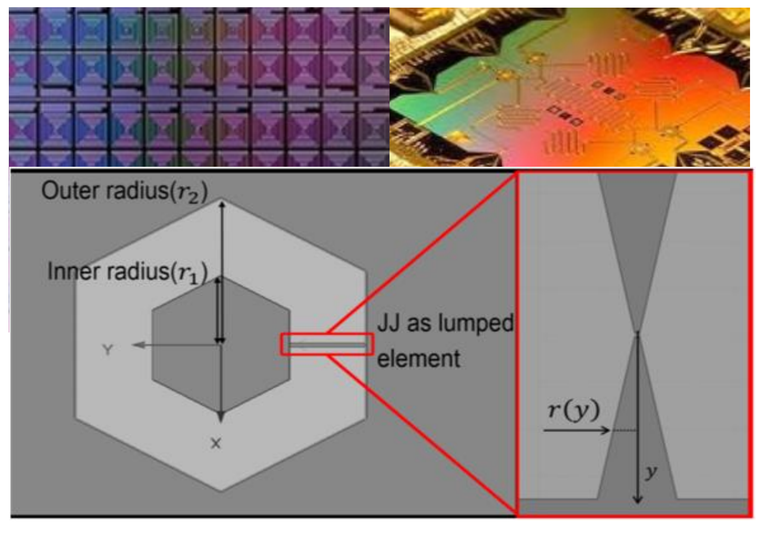
Defense Technology

- Magnetohydrodynamics (MHD) ship
- Minesweeping
- Deperming, Degaussing



Quantum Computing

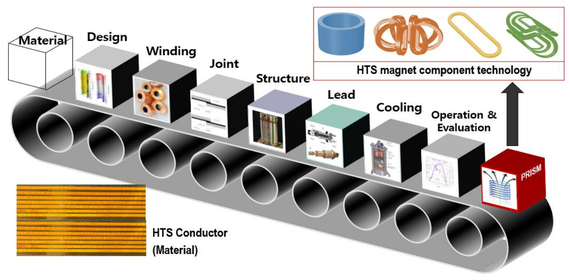
- Quantum Computing
- Cryogenic Computing
- Superconducting Resonator



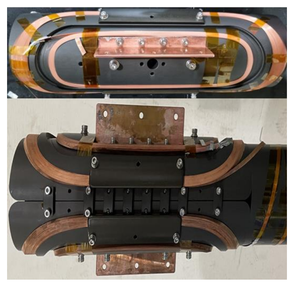
What you can achieve

Research for applications of superconductor

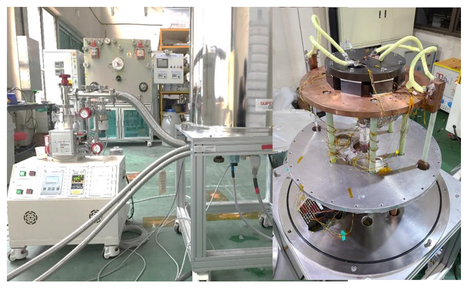
- Systematic superconducting magnet training course
- Multidiscipline design, construction and operate superconducting magnet
- Experience designing superconducting magnets for each application and shape



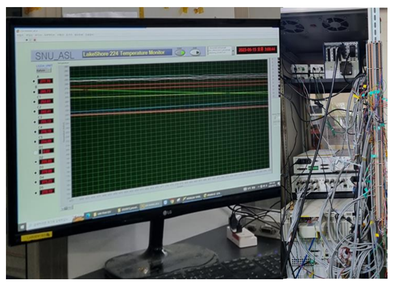
<Classification of superconducting magnet>



<Coil construction>



<Cryogenic system>

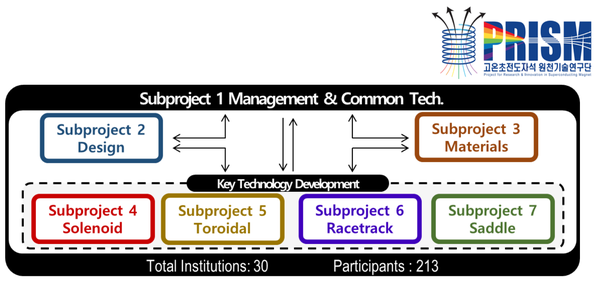


<DAQ system>

Possibility to expand into many research fields

- Opportunities to participate in practical superconducting magnet researches
- Collaboration with many other researchers
- Potential for utilize in many electromagnetic application

<ASL Members>



<Superconductor research group>

<Industry map with superconducting magnet>

Current Members

Post-doc (3)
Ph.D. Student (15)
Masters Student (4)

Alumni

Ph.D. (4)

UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN

NATIONAL HIGH MAGNETIC FIELD LABORATORY

KETI 한국전자기술연구원
Korea Electronics Technology Institute

Masters (2)

筑波大学 University of Tsukuba

国家电投 SPIC 上海核工程研究设计院股份有限公司
SHANGHAI NUCLEAR ENGINEERING RESEARCH & DESIGN INSTITUTE CO.,LTD.