



# Institute of Refrigeration and Cryogenics (IRC)



## 1. Description

The Institute was founded in 1956 and is recognized as the earliest Chinese institute enrolling undergraduate students in the major refrigeration and cryogenics. IRC started the master degree program in the first batch in 1981 approved by the State Council, and then doctoral degree program in 1986.

There are currently 15 professors, 8 associate professors, 1 senior engineer and 2 assistant professors working in the institute. The director Prof. WANG Ruzhu is now Chair professor of SJTU. He was granted the National Science Fund for Distinguished Young Scholars, the Cheung Kong Scholars Distinguished Professor from the Ministry of Education, and the innovative research team leader of NSFC. He was also the winner of the J & E Hall Gold Medal in 2013, Nukiyama memorial award in 2018. Two faculties were awarded the NSFC for Excellent Young Scholars. Seven faculties were awarded New Century Excellent Talents from the Ministry of Education. Currently, the institute has more than 200 graduate students for master or doctor degrees.

IRC has accomplished many research projects assigned by the government, such as State Key Technology Project, NSFC Project, National Defense Project, and other projects from municipal government and industries. The total amount of funding approaches 60 million RMB in 2017.

## 2. Key Research Fields

- Vapor Compression Refrigeration and Heat Pump
- Sorption Refrigeration and Heat Pump
- Digital Design of Refrigeration and Heating, Ventilation and Air Conditioning Equipment
- Built Environment Design and Control
- Thermal Energy Storage (Heating and Cooling)
- Gas Liquefaction and Cryocoolers
- Solar Heating and Cooling
- Net Zero Energy Building and Off-grid Zero Energy Building
- Heat and Mass Transfer related to HVAC, Refrigeration & Cryogenics

## 3. Labs, Centers and Groups

- Laboratory of energy utilization in refrigeration and HVAC systems
- Laboratory of digital design of refrigeration and air conditioning systems
- Laboratory of cryogenics
- Laboratory of solar energy application
- Laboratory of engineering research center of solar energy, MOE China
- Laboratory of Shanghai cryogenic technology service center

## 4. Instrumentation & Facilities

- Thermophysical property measurement facilities
- Sorption property measurement facilities (ASAP, TGA)
- Cryocoolers working at liquid helium temperatures (low temperature support)
- Energy storage and adsorption air conditioner testing bed (thermal driven bases)
- Heat exchanger testing bed (with controlled temperature and relative humidity)
- Thermal expansion coefficient measurement facility
- Thermal conductivity measurement facility
- Flexible insulated thermal environment system for testing moving structures and devices
- Cryogenic chamber for equipment testing
- Large scale extreme-condition thermal environment simulation system
- Helium leak detector, Pfeiffer vacuum, ASM 310
- Thermal conductivity analyzers, hot disk, TPS 2500S
- Surface area and porosimetry measurement analyzer, micromeritics, ASAP 2020
- Density meter, Anton paar, DMA4500M
- Thermal diffusivity analyzer, NETZSCH, LFA447
- UV-VIS-NIR spectrophotometer, SHIMADZU, UV-3600
- High speed camera, Japan NAC, GX-3z
- 4K 2-Stage GM cryocooler, SUMITOMO, RDK-408D2
- Contact angle meter, Kino Industry Co., Led, C60
- Surface tension meter, Kino Industry Co., Led, A60

## 5. Website

<http://www.sjtuirc.sjtu.edu.cn/en/>

## 6. Director

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