냉동시스템 및 열유체 연구실

❖ **Prof. Ji Hwan, JEONG**

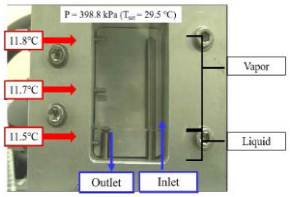
학사, 1988, 서울대학교 원자핵공학과
석사, 1990, KAIST 원자력공학과
박사, 1995, KAIST 원자력공학과
Post-Doc., Oxford university, 1995 – 1996
Post-Doc., 한국원자력연구원, 1996 – 1999

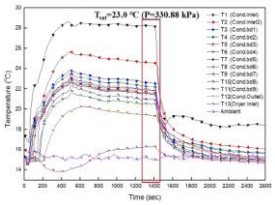
❖ 대한기계학회 열공학부문 회장, 2020
❖ 캠퍼스아시아 사업단장, 2016 - 2019
❖ 부산대학교 기계공학부 대학원학부장, 2019 -
❖ 부산대학교 기계공학부 BK 사업단장, 2019 -

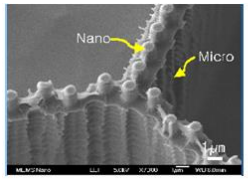
❖ 방문교수, 서울대학교, 2010 – 2011
❖ 연구교수, The University of Tokyo, 2016
❖ President of Commission B2, International Institute of Refrigeration (IIR)
❖ Delegate, Assembly for Int. Heat Transfer Conference
❖ Executive Board, Asian Union Thermal Science and Engineering
❖ Editor-in-Chief, Int. J. of Air-Conditioning and Refrigeration

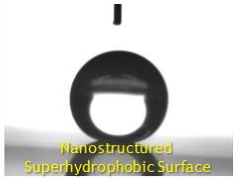
주요 연구 분야

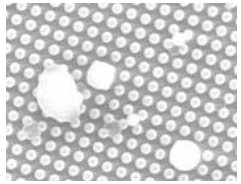
1. 열전달 성능향상 및 2상-유동
   - 열전달 촉진, 증발/응축 상변화 열전달
   - 2상-유동의 유동양식 평가
   - 동물 호흡기의 열/물질 전달 해석
2. 냉동 및 열교환기 시스템 개발
   - 냉매 열물성 및 열전달
   - 냉동/히트펌프 시스템 해석 및 설계
   - 고성능/고효율 열교환기 설계기술
3. 원자력 발전소 안전
   - 원자력 발전소 안전 해석

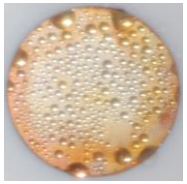


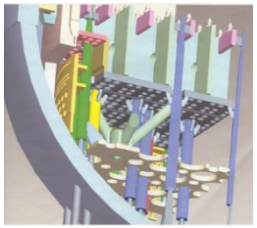


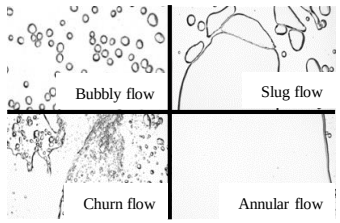


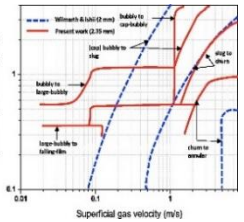






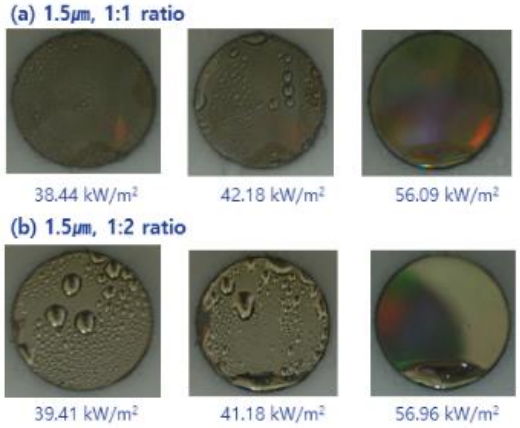




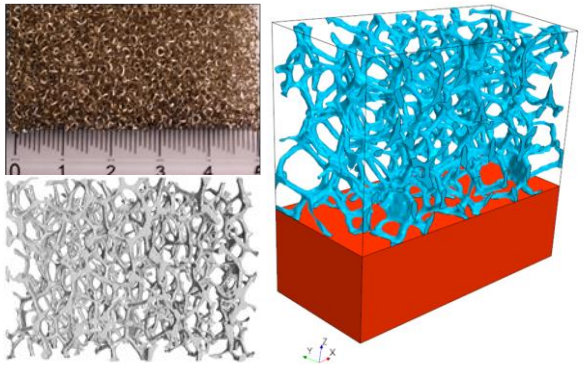


열전달 성능향상 및 2상유동

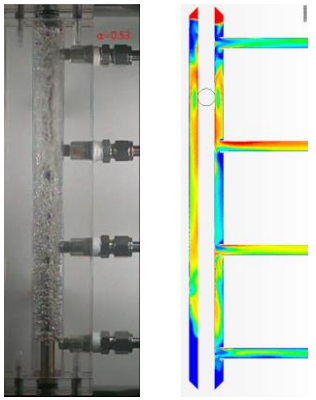
- 소수성 표면 및 액적응축 구현



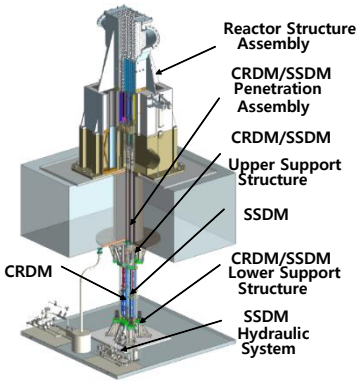
- Porous metal 열전달

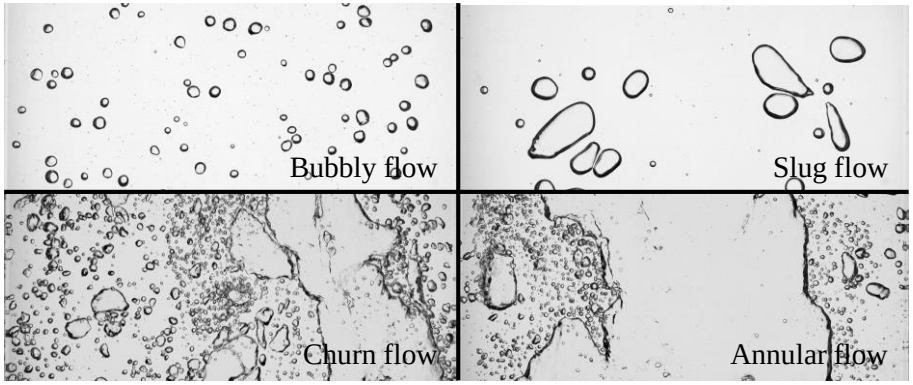


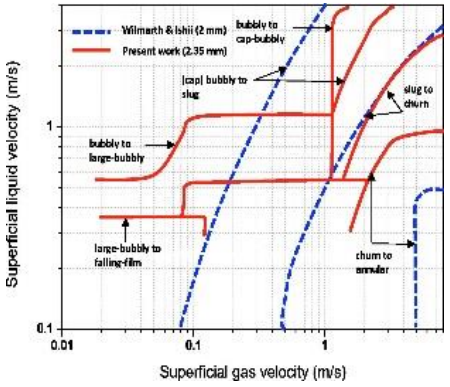
- 2상 유동 분배



- 연구용 원자로 판형핵연료 유로의 수력학적 특성 연구
  - 사각유로의 유동양식 평가 및 기존 사각유로의 2상-유동모델 개선

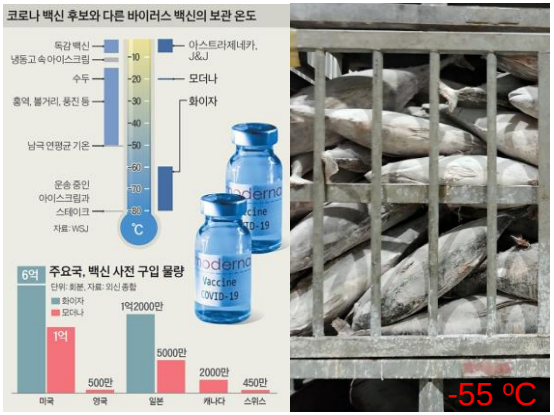






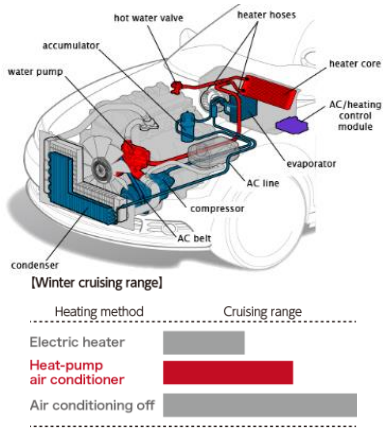
냉동 및 열교환기 시스템 개발 - 고효율 냉동시스템 해석 및 개발

- 의료/식품용 냉동 시스템

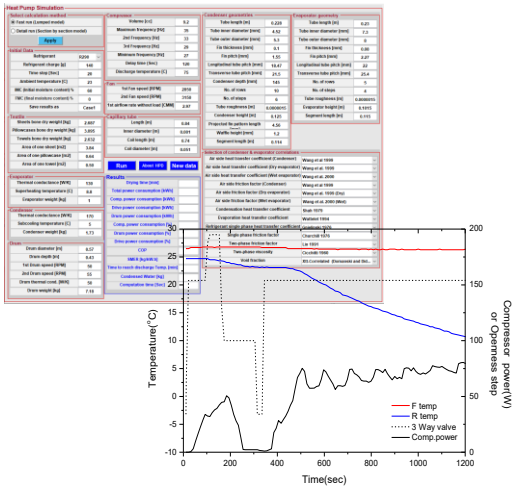


- 빌딩 공조용 heat pump

- 전기자동차용 heat pump

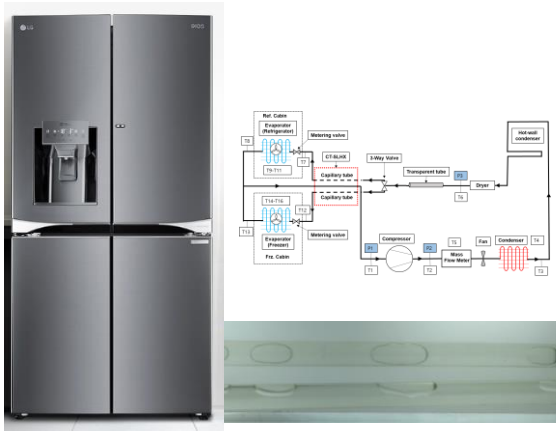


- 냉동시스템 시뮬레이션



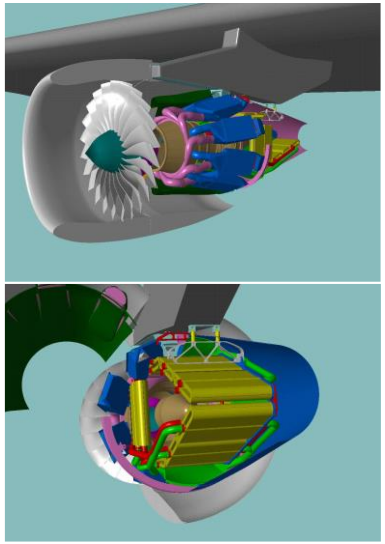
- 히트펌프 건조기 시뮬레이션

- 냉장고 에너지효율 개선



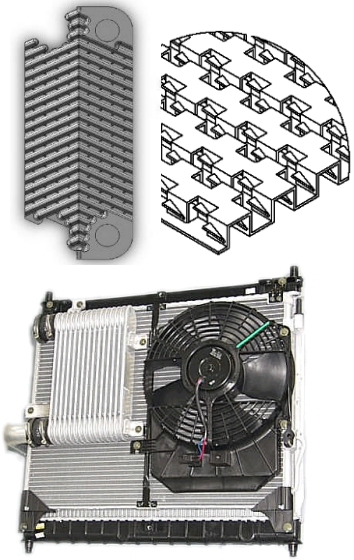
냉동 및 열교환기 시스템 개발 - 고효율 열교환기 개발 및 해석 연구

- 항공기 HEX

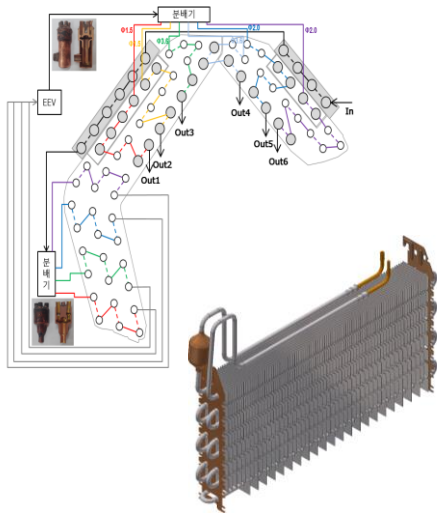


- 원자력발전소 HEX

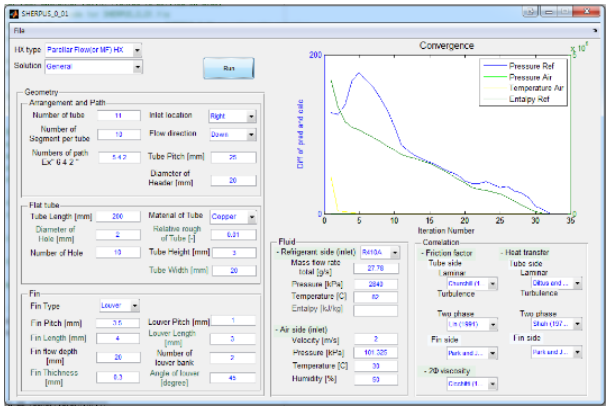
- 전기차 HEX



- 에어컨/냉장고 HEX

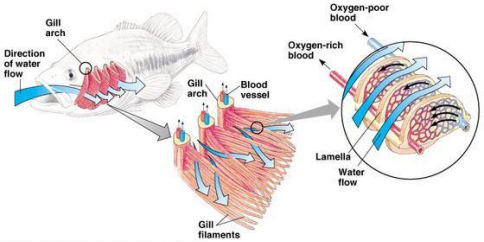


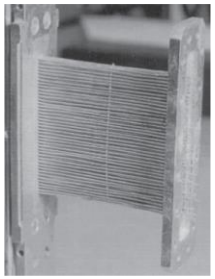
- 열교환기 S/W (판형, 휜관, 마이크로채널)

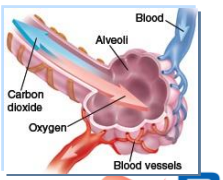


- 동물 호흡기 모사한 열교환기 개발

$$\frac{St}{St_m} = \left(\frac{Sc}{Pr}\right)^{2/3} \Rightarrow \frac{h}{h_m} = \rho C_p \left(\frac{Sc}{Pr}\right)^{2/3}$$

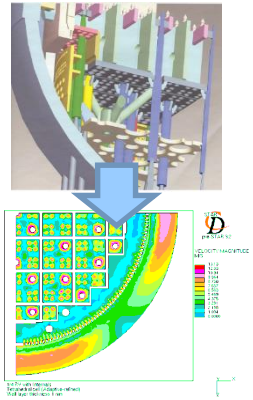


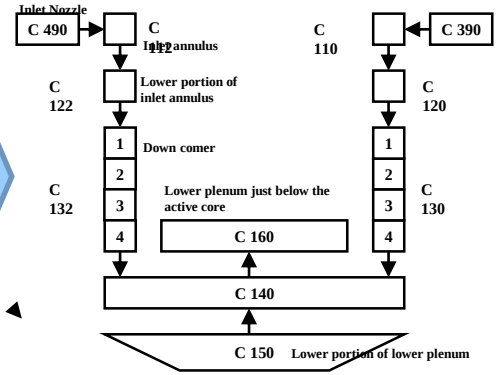




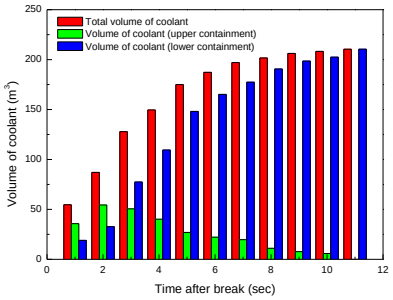
원자력 발전소 안전

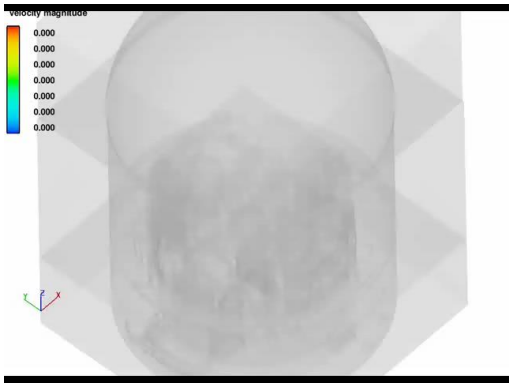
● CFD를 이용한 PWR 압력 손실 계수 평가



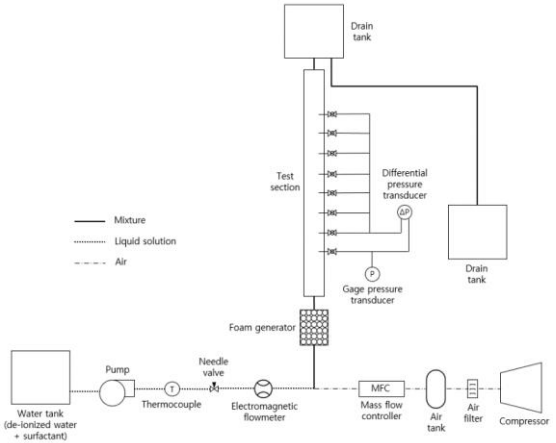


● CFD를 이용한 대형배관 파단 방출유량 평가





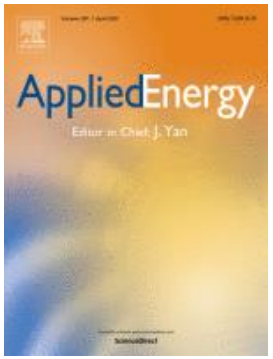
● 원전폐로시 제염위한 거품유동 유동 모델개발

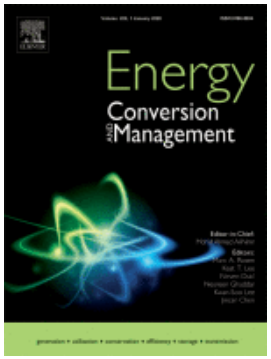


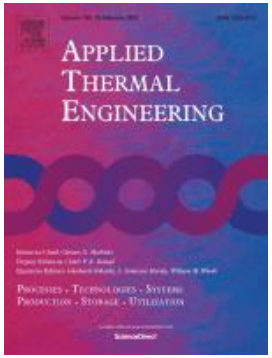
학술 활동

◆ 최근 3년간 논문 게재 현황

- 2020 : 8 편
- 2019 : 12 편
- 2018 : 9 편

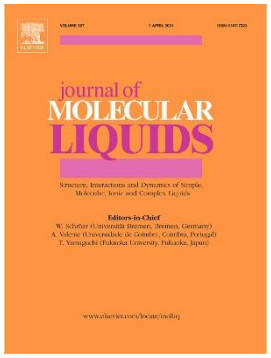


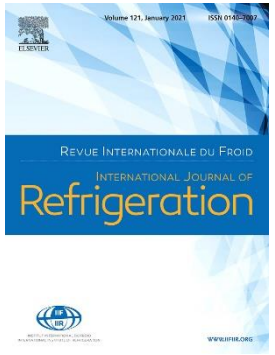




◆ 3년간 게재된 저널 (SCI)

- 냉동분야 최고 권위 저널 : 3편
- 에너지 분야 상위 10% : 14편
- 화학 및 물리학 분야 상위 10% : 1편





대학원생 교외 활동

졸업 후 진로

구성원

- 지도교수 : 정지환 (jihwan@pusan.ac.kr)
  Office : 051)510-3050
- 연구원 :
  박사후과정 : 2 명
- 학생 :
  박사과정 : 5 명
  석사과정 : 5 명
  교환학생 : 1 명

◆ 최근 3년간 졸업생 취업 현황

- 대학교수 : 1명
- 국공립 연구소 : 1명
- 대기업 : LG전자 (5), 삼성전자 (1),
  SK매직 (1), 대우건설 (1)
- 진학 : 2명 (유학 : 1)

◆전체 졸업생 취업 현황

- 원자력 및 방산 계열
  KAERI (한국원자력연구원), KHNP-CRI 및 KHNP (한국수력원자력 중앙연구소 및 한국수력원자력), KINS (한국원자력안전기술원), KNFC (한전원자력연료), KITECH (생산기술연구원), DTAQ (국방기술품질원), 한화테크윈 등
- 냉동 시스템 계열
  Professor, Samsung electronics, LG electronics & LG electronics CTO, Hanon System, Kyung Dong NAVIEN R&D Center, Renault Samsung motors, Hyundai motor Beijing 등