

Presentations of collaboration research plans
by sub-research group leaders

1. Clusters group – Kang (leader), Ryu, Cho, Hur
2. Compact object group – Kwak (leader), Lee, Hui, van Putten
- 3. XFEL lab astro group – Chung (leader), Kim, Ryu, Kwak**
4. RAON lab astro group – Chae (leader), Kwak, Lee

🌟 Participation in the PAL-XFEL operation and user program

고에너지(~10 keV), 고강도 세기,
결맞음 상태의 X-선 발생



PAL-XFEL 성능 향상 연구
(허민섭, 정모세, Sandeep Kumar)

- [1] Journal of Applied Physics 121, 243101 (2017)
- [2] Journal of the Optical Society of America B (submitted)
- [3] Echo-enabled high-harmonic generation in hard X-ray (just started)



X-선 빔라인 활용 연구 참여
(김채운, 정모세)

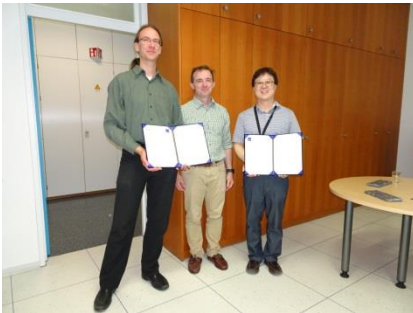
- Join Prof. Cho's (GIST) experiment as an observer

10 12/13-12/15 (3) : Byoung-Ick Cho (XAS/XES@SSS, 930 eV; GIST)
Non-Equilibrium Electron & Ion Dynamics of Warm Dense Matter

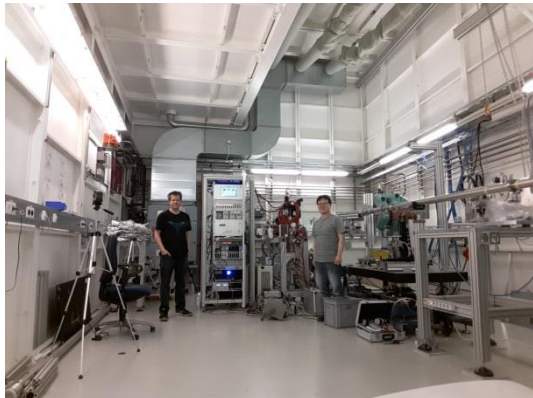
- Prof. Chae-Un Kim will make 6 hour test experiment in December
- Beam time proposal under preparation in collaboration with DESY/MPIK

🔥 Collaboration with MPIK group

X-선 관측 스펙트럼 분석을 위한 X-선 분광 데이터 획득 실험 준비

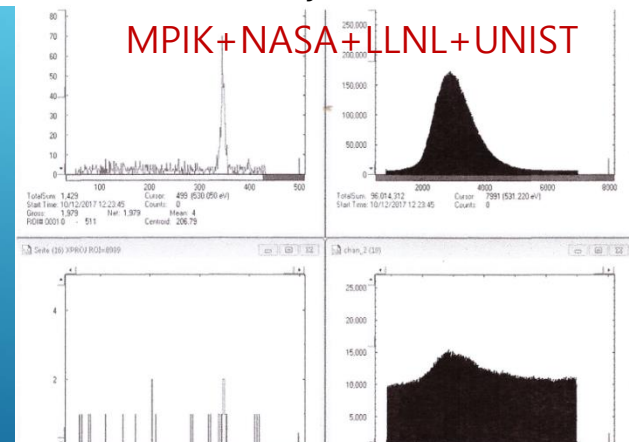
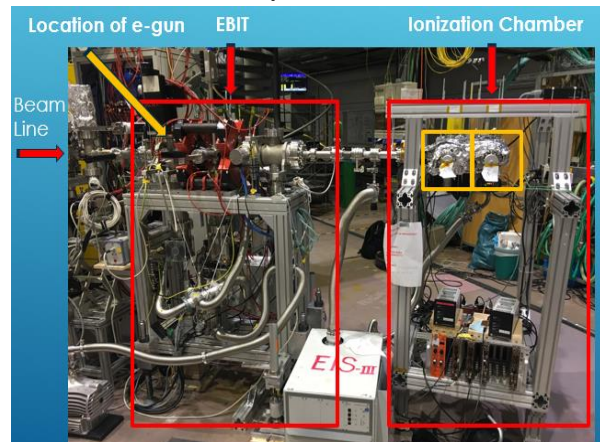


Max-Planck 연구소와 공동 연구 추진



Participate in the experiments at DESY/PETRAIII (June/July, 정모세)

Successful experiment with mini-EBIT at BESSY-II Synchrotron (Oct.)



Experiment title:

High precision absolute calibration of O2 K-shell absorption spectrum

Proposal type: Standard (ST)

Scientific College: C4

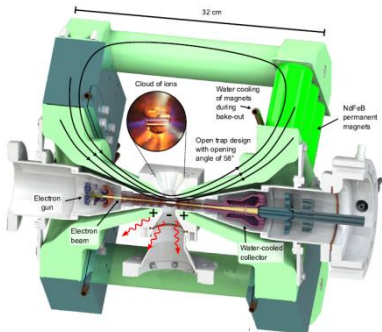
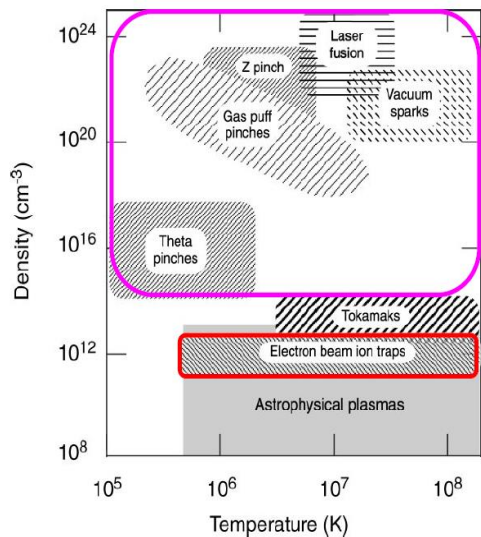
Abstract:

Wavelength calibration standards are typically the limiting factor in absolute transition energy measurements using high-resolution plane grating monochromator instruments at synchrotron facilities. Recent synchrotron measurements of the absorption spectrum of atomic O disagree with astrophysical measurements by far more than the claimed calibration uncertainties. The laboratory measurements are calibrated on O2, while the astrophysical measurements are calibrated on H-like and He-like ions of oxygen and other elements. We propose to calibrate the absorption spectrum of O2 using the fluorescence signal from H-like and He-like O and N ions created and trapped in our portable electron beam ion trap. This will allow the creation of calibration standards with accuracy limited only by the resolution and stability of the beamline monochromator.

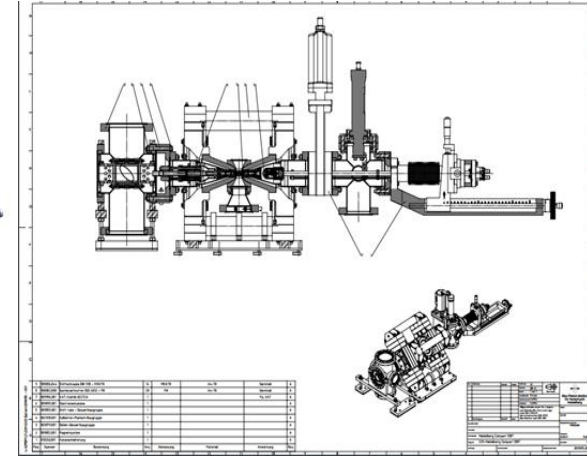
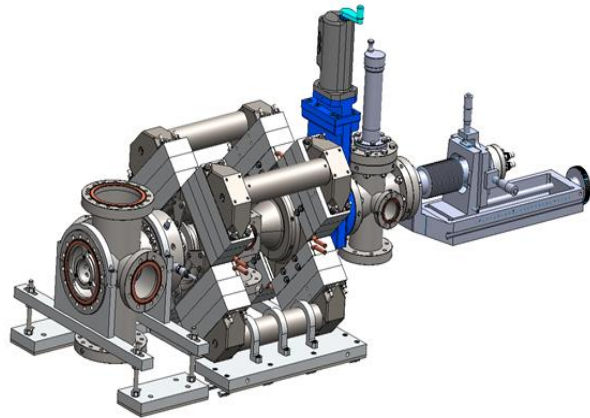
- Keep participating in activities of MPIK and prepare joint proposal (with astrophysical significance) for PAL-XFEL experiment

Design and Construction of our own EBIT

EBIT (Electron Beam Ion Trap) 을 통한 천체 플라즈마 구현



초전도자석 대신 영구자석을 이용한 디자인 차용: 장치 구축 비용 절감 (총비용 ~1.5억 내외 예상)



- 2 years with 1 full-time PhD student and 1 part-time PhD student (depending on the progress, we may hire one postdoc later)
- All the drawings and part list are already provided by MPIK's Jose's group
- Purchase of some main components has been started (crane, vacuum pump, chiller, power supply, e-gun cathode etc.)
- Strong interest in plasma physics and atomic physics communities (Dr. 정현경, Dr. 권덕희, Prof. 김동언, Prof. 최원호, Prof. 김영철 etc.)