Mar. 2, 2005, 17:50 - 21:45

Fairmont Hotel / Belvedere Room, San Jose, USA

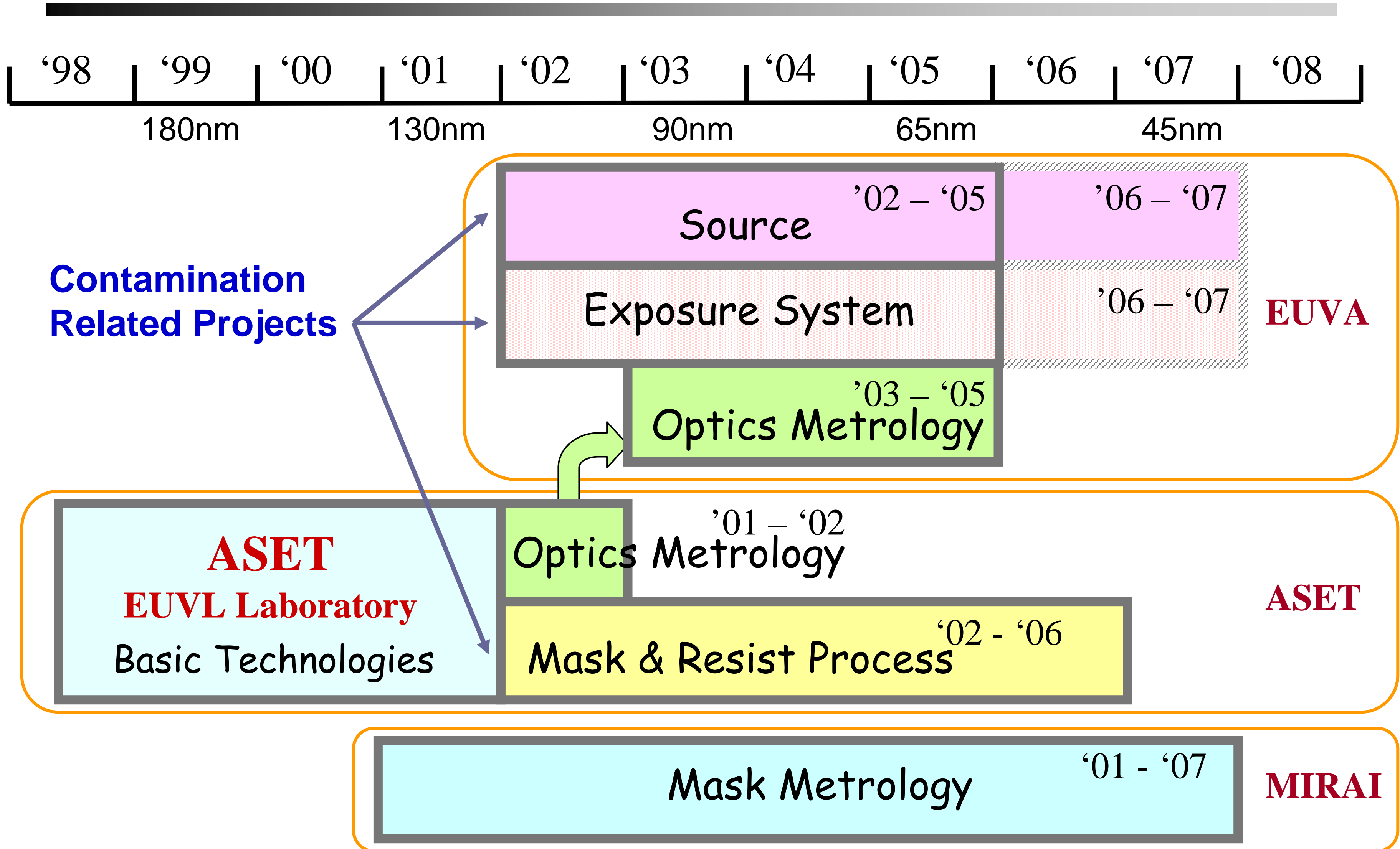
IEUVI Contamination & Optics TWG meeting

ASET Update

ASET EUV Process Technology Laboratory

Iwao Nishiyama

EUVL Development Plan in Japan



ASET
EUV Process Technology

Optics Contamination Workshop in Japan

1. May 24, 2004 :
   - High energy particle observation from LPP (EUVA)
   - Modeling for high energy ion generation from LPP (Leading Pj)
   - Contamination study in New SUBARU (HIT)

2. Oct 15, 2004
   - Modeling of energy distribution for ions generated by LPP (Leading Pj)
   - Erosion mitigation method in LPP (EUVA)
   - Debris mitigation for DPP（EUVA)
   - Surface model for contamination growth on EUVL mirror (EUVA)

3. Feb. 10, 2005
   - Status of EUVA contamination study (EUVA)
   - EUV intensity dependence and water pressure dependence on contamination growth (HIT)
   - Atomic Hydrogen Cleaning (ASET)
   - Modeling for high energy ion and neutral atoms generation from LPP (LP)

Contamination/Optics lifetime testing facilities

Outgas Evaluation Apparatus at SBL-2 of Super ALIS

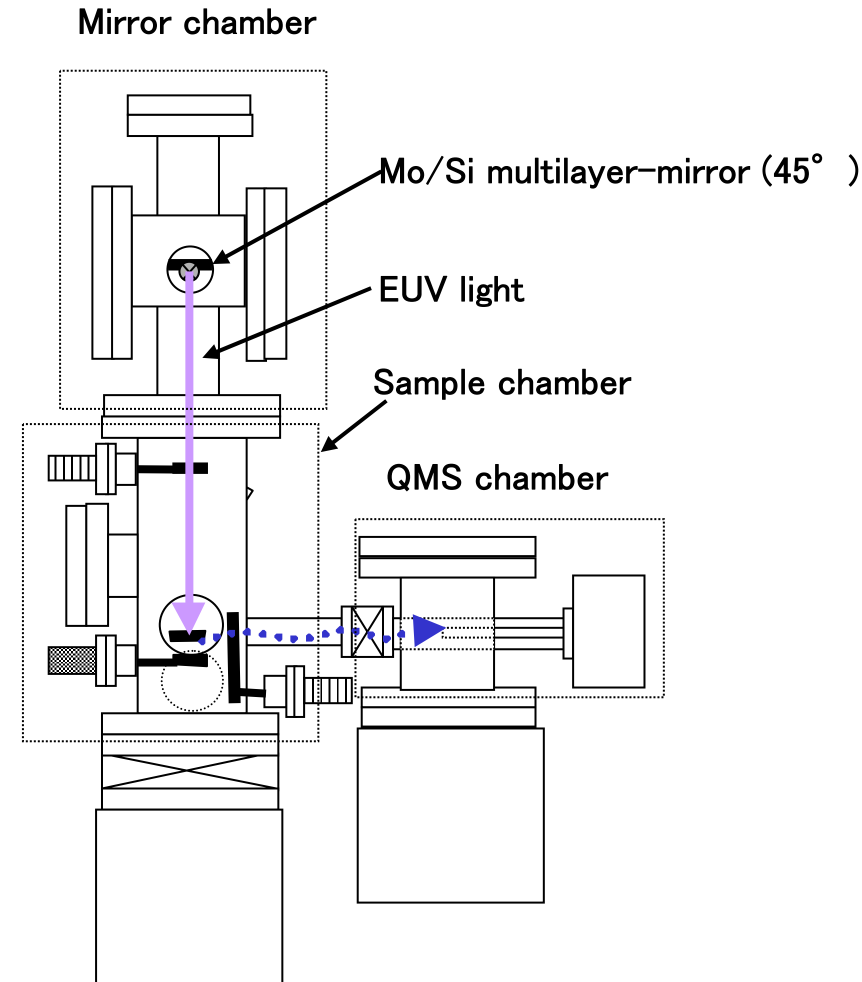
Experiment of outgas evaluation

Method:

- **Direct measurement of pressure rise by outgassing**
- **Evacuation speed is defined by orifice conductance**

Estimation of pressure rise

- **Typical Outgas speed**
  = 1×10^{12} molecules s^{-1}
- **Conductance of orifice($1 cm^2$)**
  =10 l/s
- **Pressure rise**
  = 3×10^{-7} Pa



Cleaning of Carbon Contamination by Hydrogen Atom with Cat-Cleaning Tool

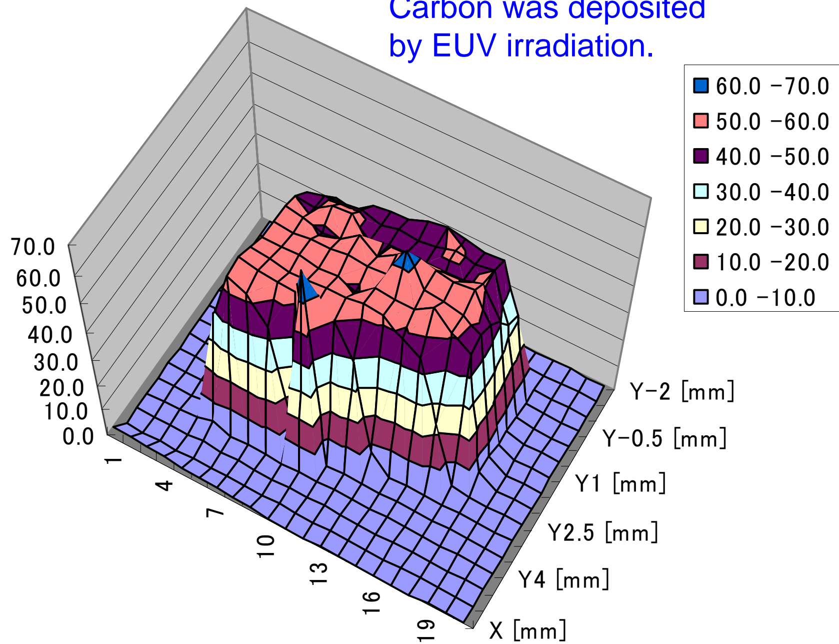
This work was performed under the collaboration with Japan Advanced Institute of Science And Technology（JAIST） and Kyushu Institute of Technology.

Atomic Hydrogen Cleaning of Carbon Contamination (1)

Before cleaning

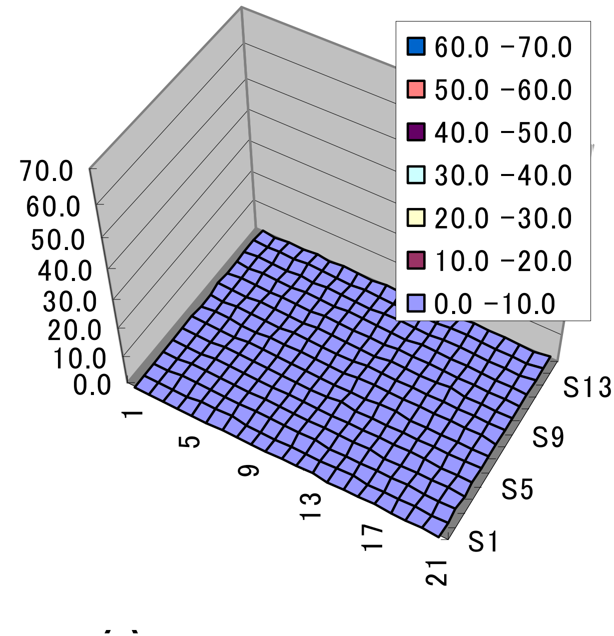
Thickness: 5.6 nm

Carbon was deposited by EUV irradiation.



After cleaning

Thickness: negligible



Carbon contamination has been removed almost completely.
The cleaning rate was >0.6 nm/min