EXTATIC

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Tehran, Iran

DCU RWTH AACHEN UNIVERSITY University of Southampton UCD DUBLIN

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• Educational Background

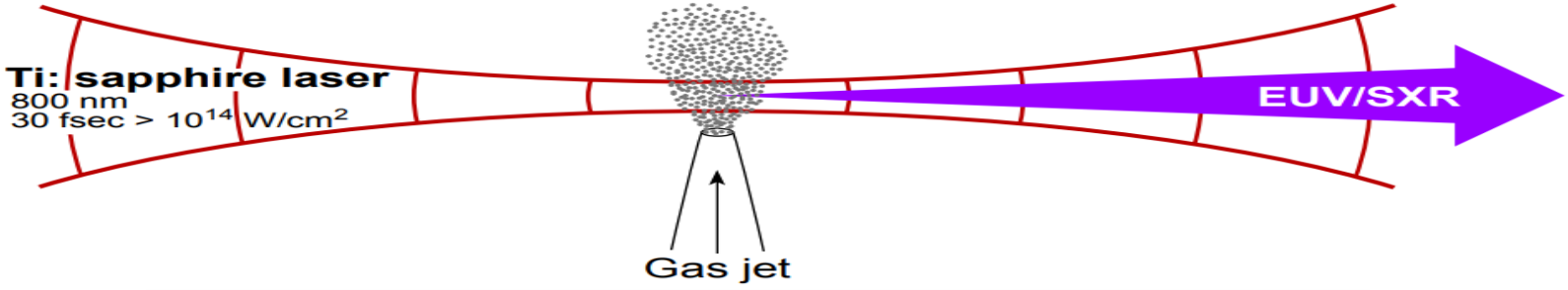
- B.Sc. In Engineering Physics
- (2007 - 2012) **Islamic Azad University, Science and Research Branch**, Tehran, Iran

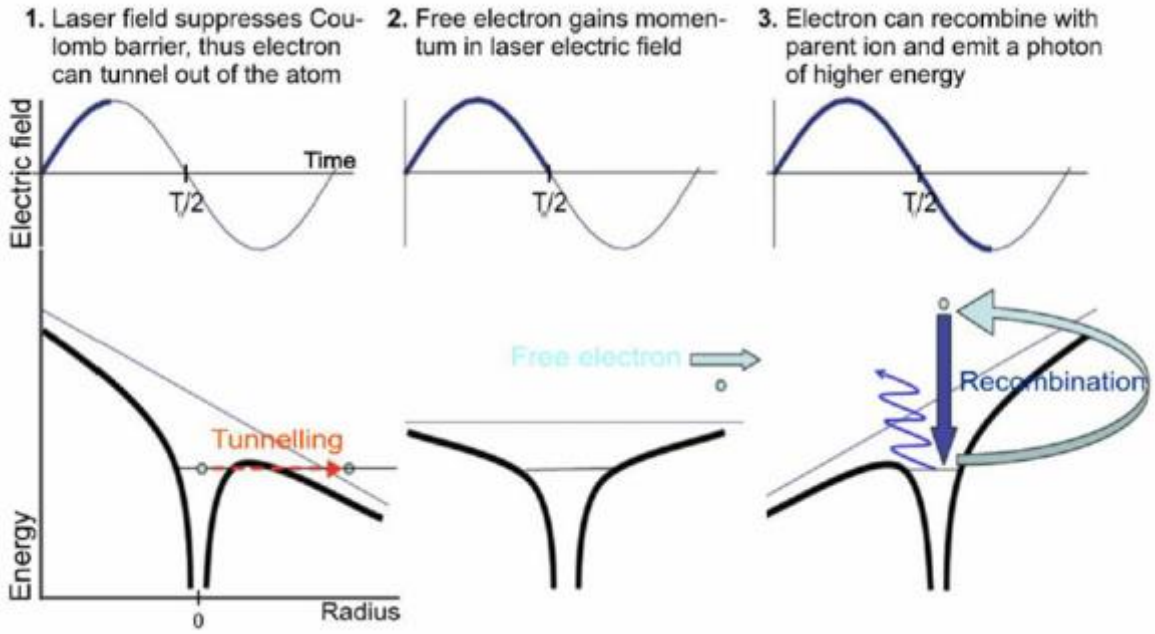
• M.Sc. In Photonics

- (2012 - 2014) **Physics department, University of Guilan,** Rasht, Iran

- **Thesis subject:**
- **Study the coherent gas state in High order Harmonic Generation yield.**

- High order harmonic generation





- PhD thesis subject:
  - Methodology development for characterization of nanostructured layered systems using extreme ultraviolet scatterometry

As a member of EXTATIC program :
Home university: RWTH Aachen
Host university: Southampton university

Introduction

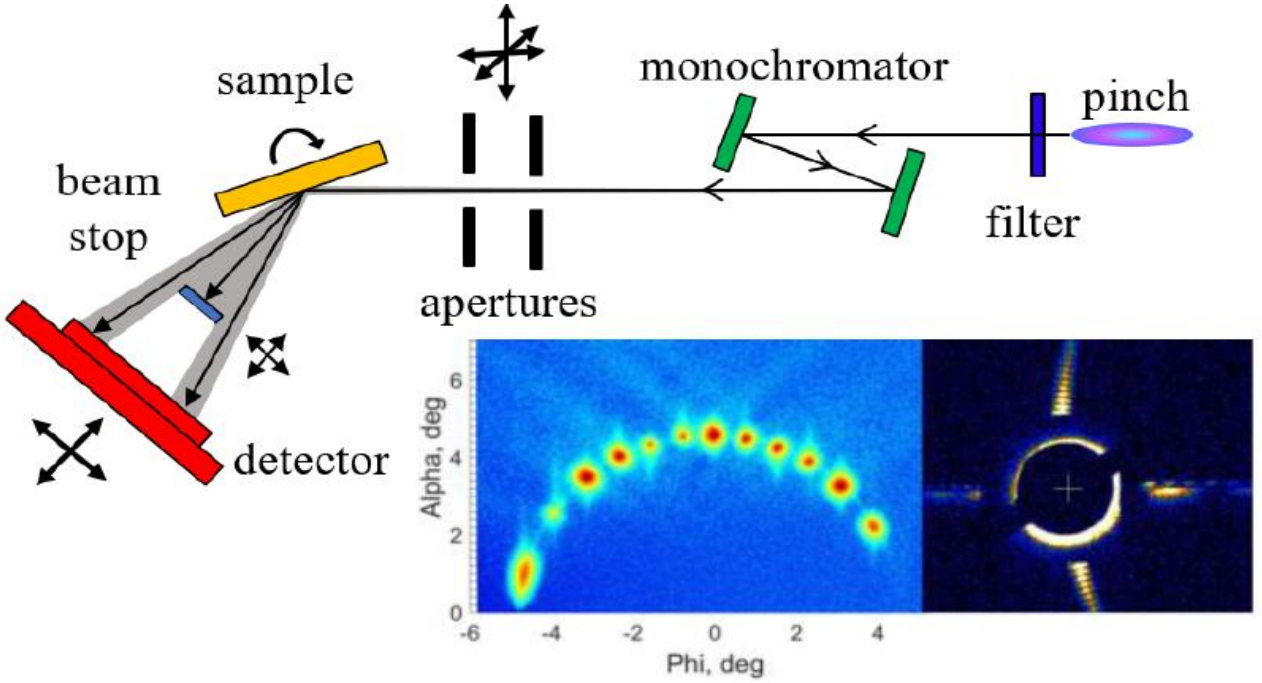
- Optical Scatterometry is a powerful technique for:
- Surface roughness metrology
- Comprehensive profile characterization of nano-structured surfaces
- Scatterometry benefits:
- Fast
- Non-contact
- Non-destructive
- Providing the data on the surface power spectral density function (PSD)

• EUV Scatterometry

- Scatterometry is widely used for critical dimension (CD) and overlay displacement errors in semiconductor manufacturing.

- The benefits of applying scatterometric techniques in shorter wavelength range are:
- Increased sensitivity to small structural features and roughness
- Larger number of diffraction orders as compared to UV
- Better material contrasts
- Larger penetration depth into metals

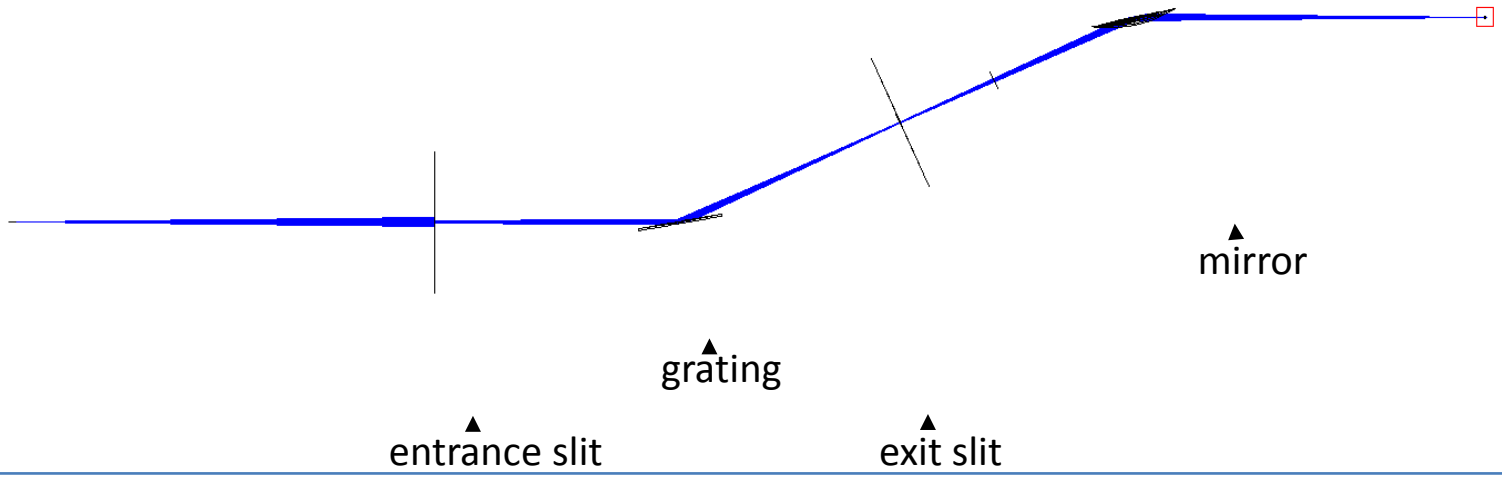
- Scatterometer setup



Schematic of scatterometer. Insets: measured distribution of diffraction from a holographic grating for off plane grazing incidence illumination (left) and from a hexagonal periodic quantum dot lattice with 100 nm half pitch(right)

• Outlook

- At the moment I am studying the literature on EUV and scatterometry.
- At first I will try to operate the setup that was used in this group in the previous works. Then I will integrate the monochoromator in the system. This will enable choosing the wavelength by rotating the grating



• Outlook

- I will learn to perform rigorous diffraction simulations. There are two software candidates, BornAgain and JCMwave. I am studying them to find out which one would be better for my work and enable fitting experimental data.
- I will compare the simulation and experimental results to figure out the sample characteristics.

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Thank you for your attention!

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