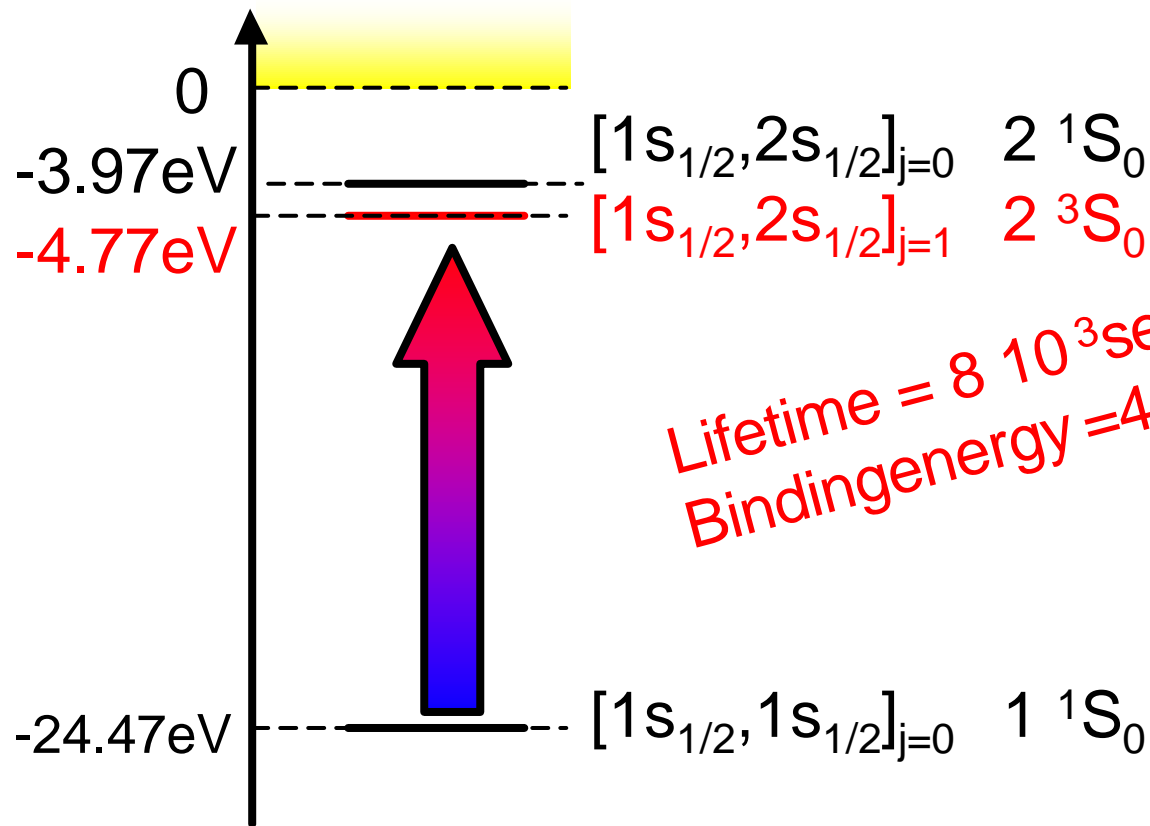


# A Metastable Spinpolarized Gas Target for ESR

- **Goal: Provide an internal Target beyond ground state rare gases**
- 2 Electron system (Helium)  
different wavefunction for collision experiments  
(correlation, symmetry effects in single and double ionization)
- Spin polarization (relativistic effects)

# Metastable Helium

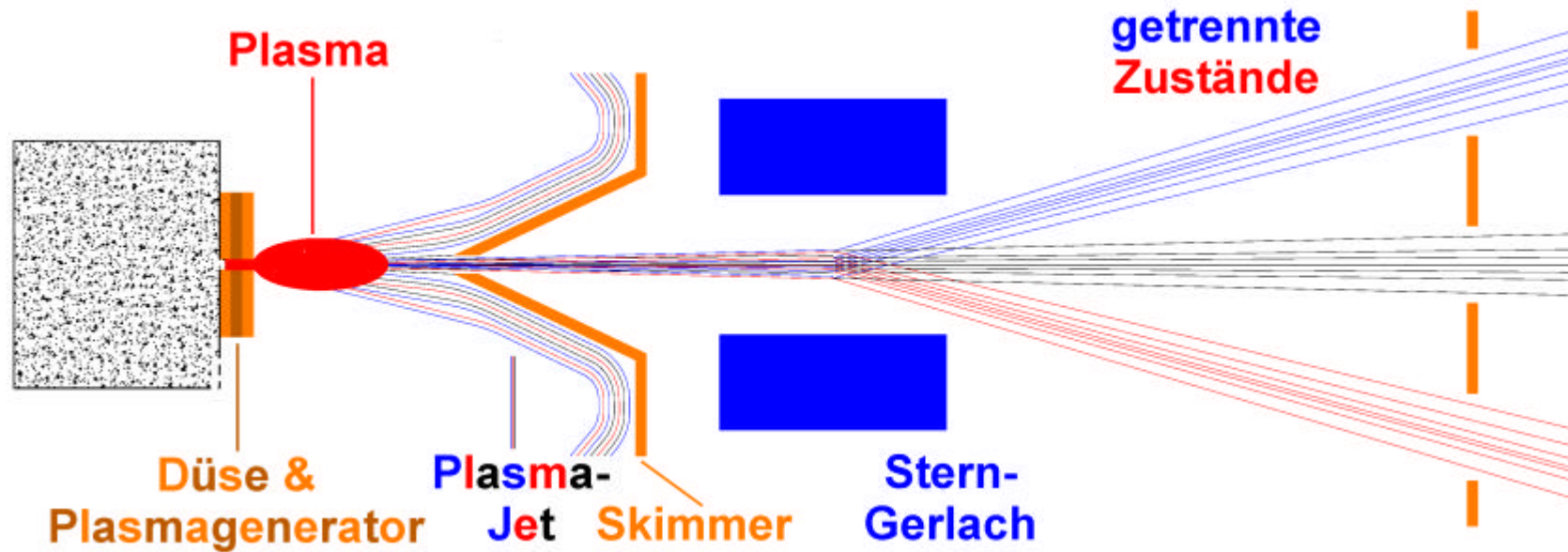


Lifetime =  $8 \cdot 10^3 \text{sec}$   
 Binding energy =  $4.77 \text{eV}$

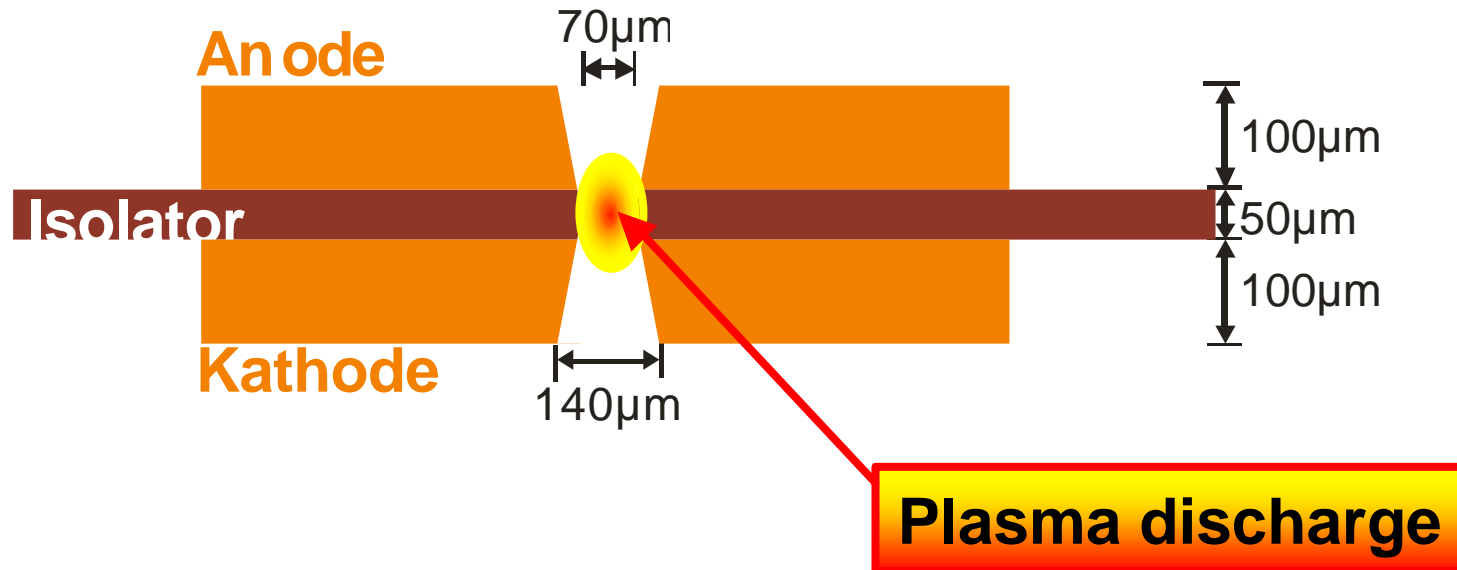
- 1. Create:**  
 Electron Impact Excitation (Plasma)
- 2. Select:**  
 (Stern-Gerlach Magnet)

# Motivation

Compact Source for excited / metastable atomic beams



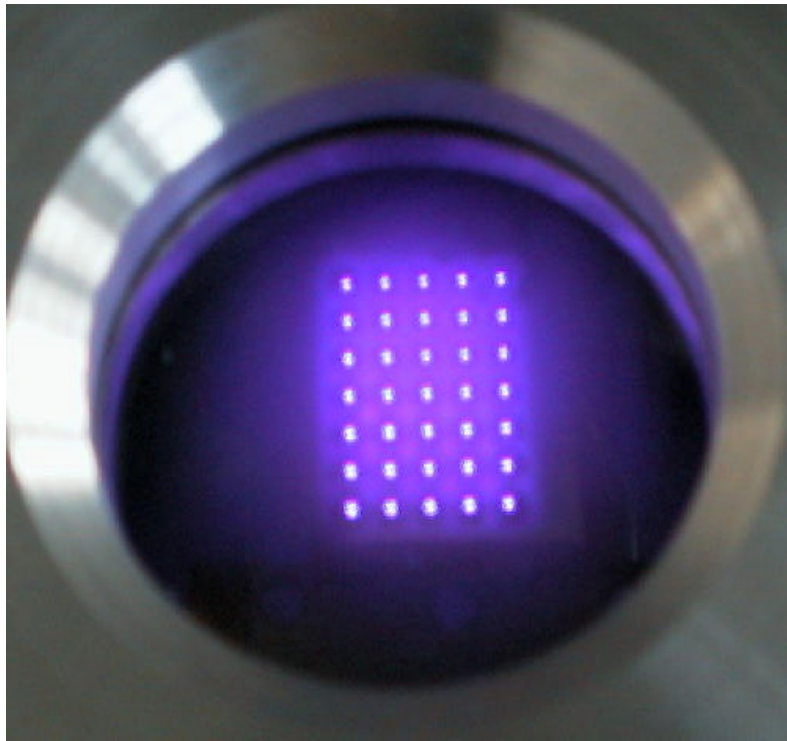
## Microstructure Ion/Atom Source



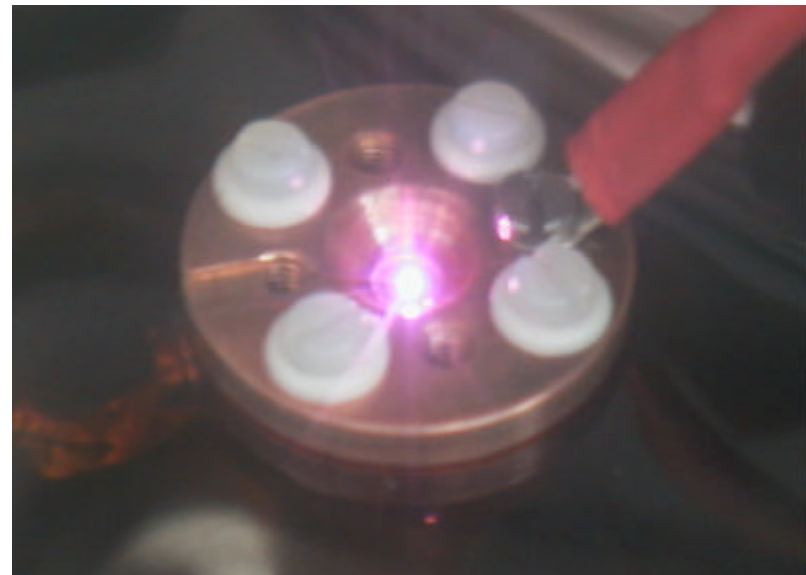
### Advantage of small size:

- High pressure/low Voltage
- Very efficient
- **Nozzle for Supersonic Jet**

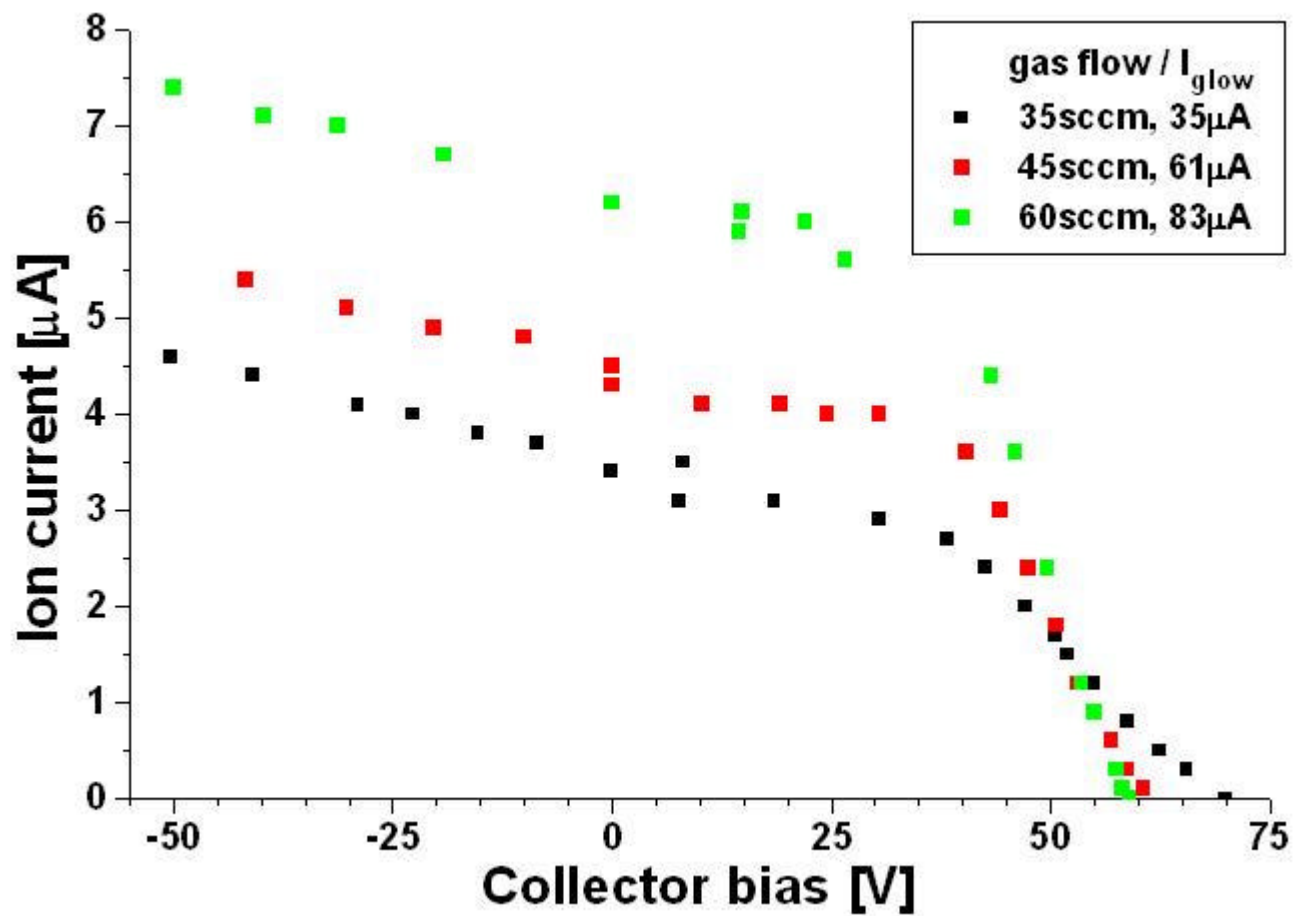
Discharge in a  
Micro pore array

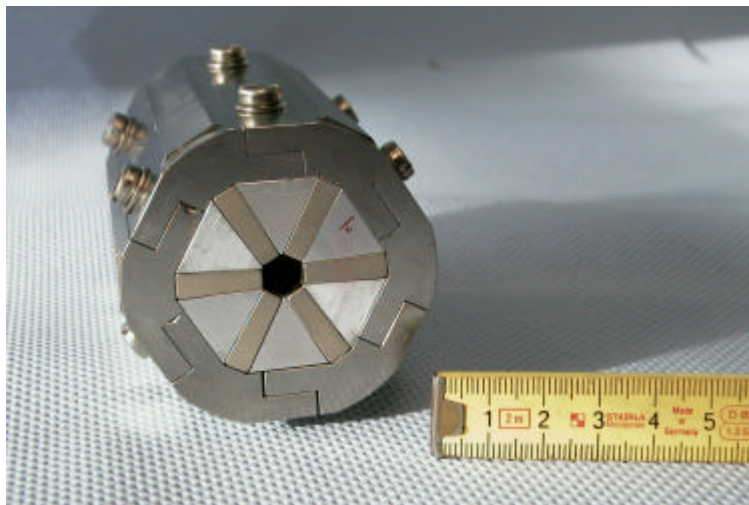


Single Pore  
Gas Nozzle

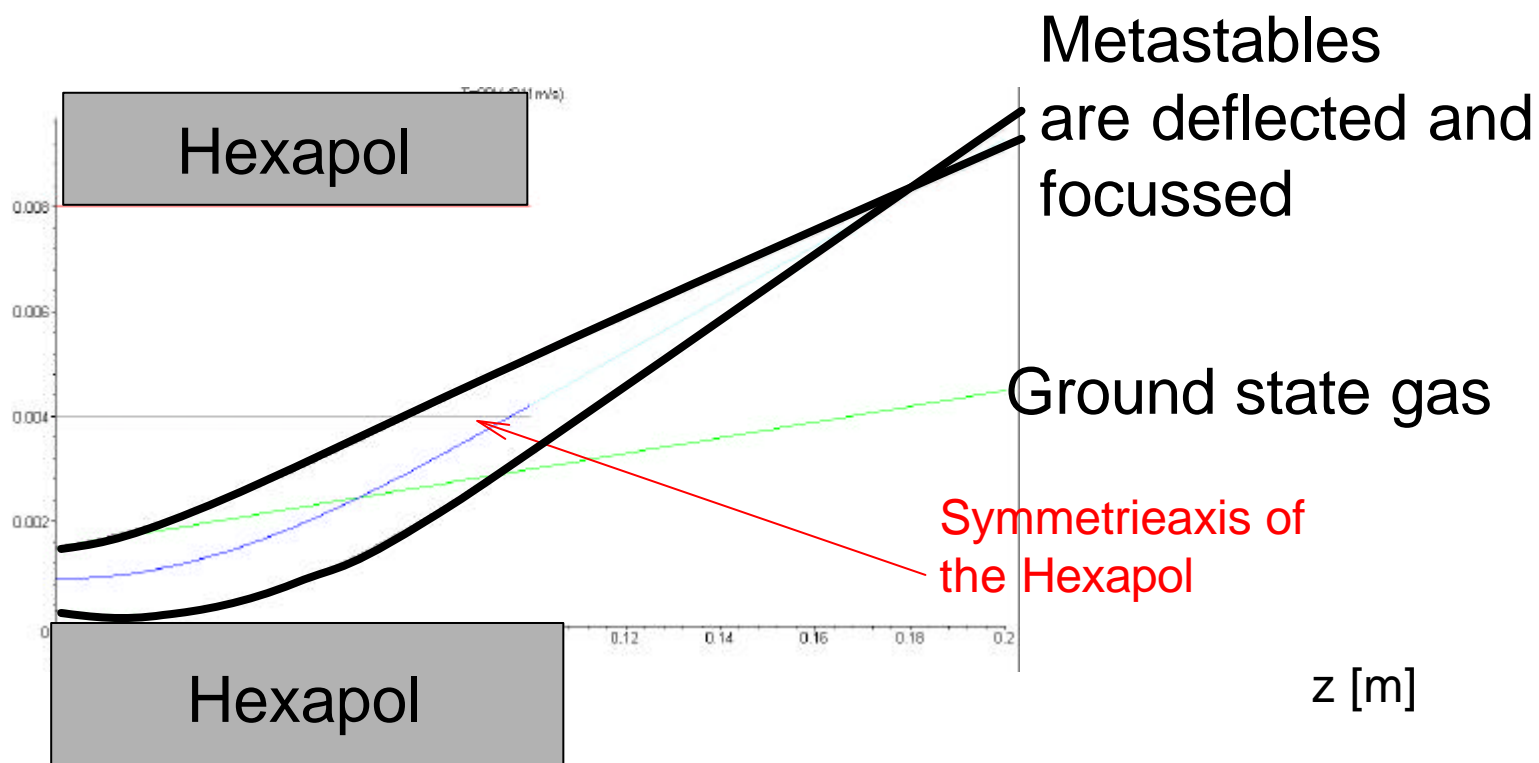


# Total extracted current from one hole





[m]



**T.Jahnke**

**S. Schössler**

**O. Hohn**

**L. Spielberger**

**C. Penache**

**H. Schmidt-Böcking**

**U. Frankfurt**

**A. Bräuning-Demian**

**GSI**

**R. Dörner**

**U. Freiburg**