

# NEXRAY - Next Generation X-Rays

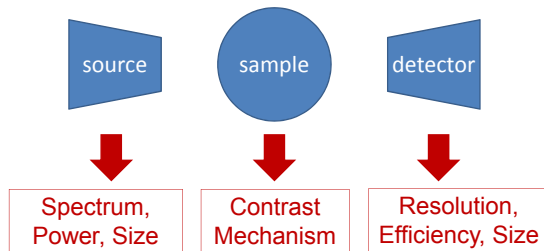
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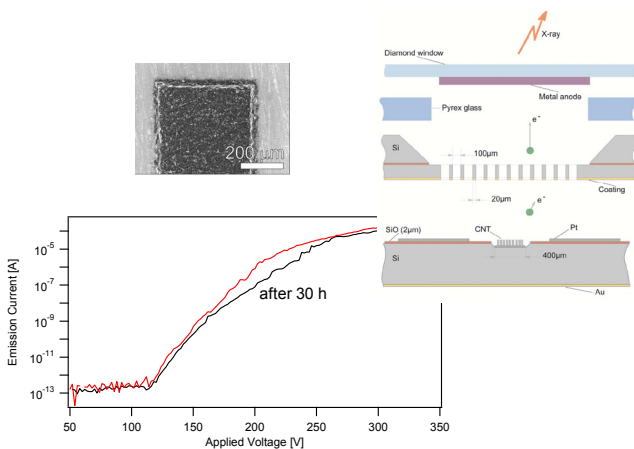
(C) **ETH** Eidgenössische Technische Hochschule Zürich Swiss Federal Institute of Technology Zurich

## X-ray Systems: The Chain of Improvements



### Pocket X-ray Tubes

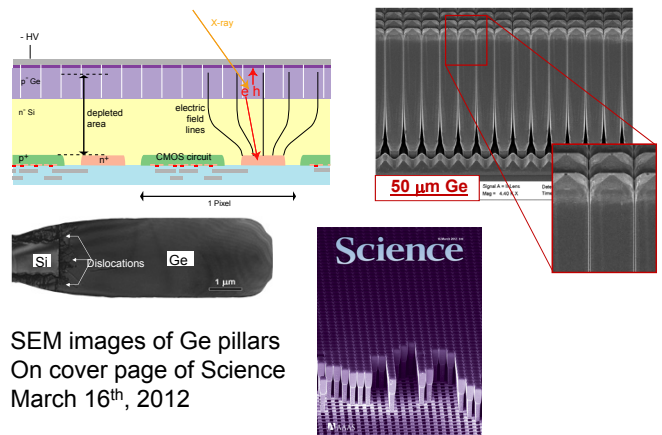
- Cold field-emission of electrons with CNTs
- Miniaturised design based on MEMS technology



CNTs show reproducible IV characteristics

### Monolithic X-ray Detectors

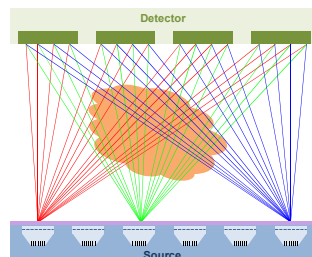
- Direct detection of X-rays in a germanium layer
- Monolithically integrated in ASIC (CMOS)
- No requirement of bump-bonding



SEM images of Ge pillars  
On cover page of Science  
March 16<sup>th</sup>, 2012

## Novel Concepts and Applications

- Large area X-ray sources
- Pixelated X-ray sources
- Pulsed operation up to GHz frequencies
- Energy resolved X-ray imaging



- Cost efficient X-ray systems
- Miniaturised X-ray systems
- Fast static CT for emergency medicine or in-line product inspection
- Imaging of fast phenomena

