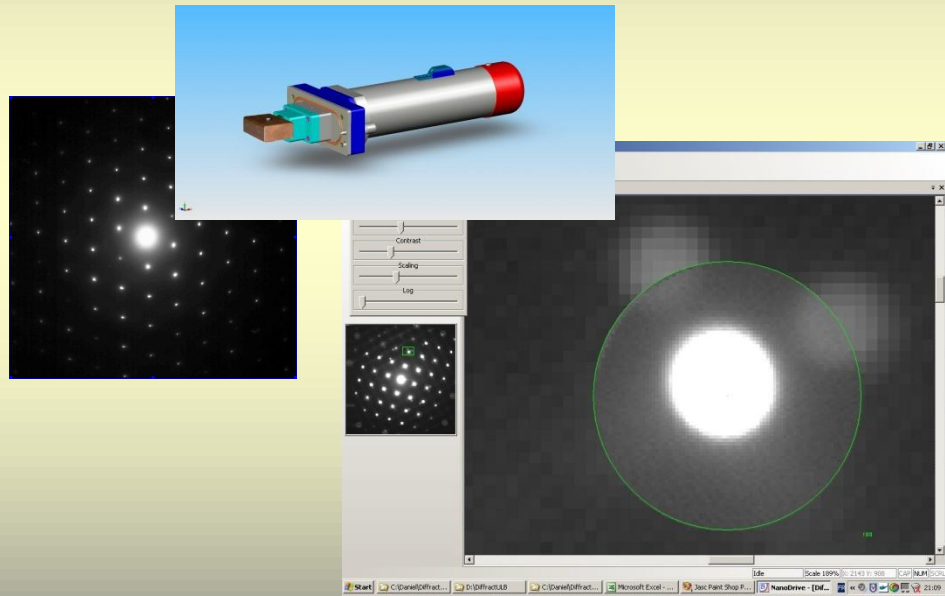
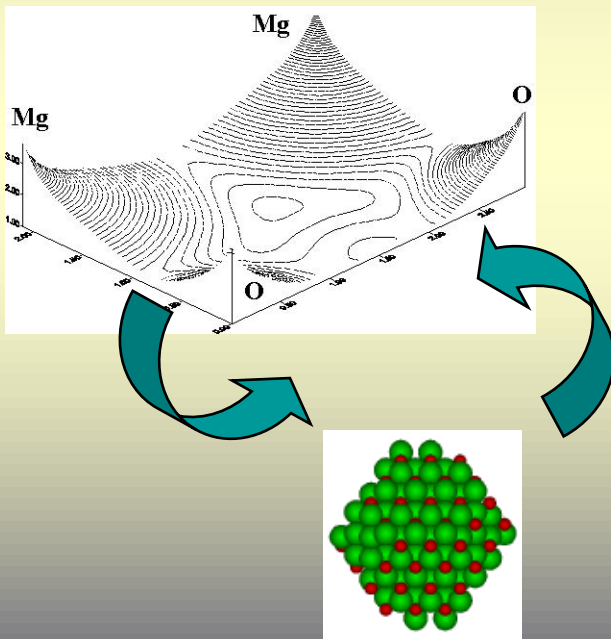
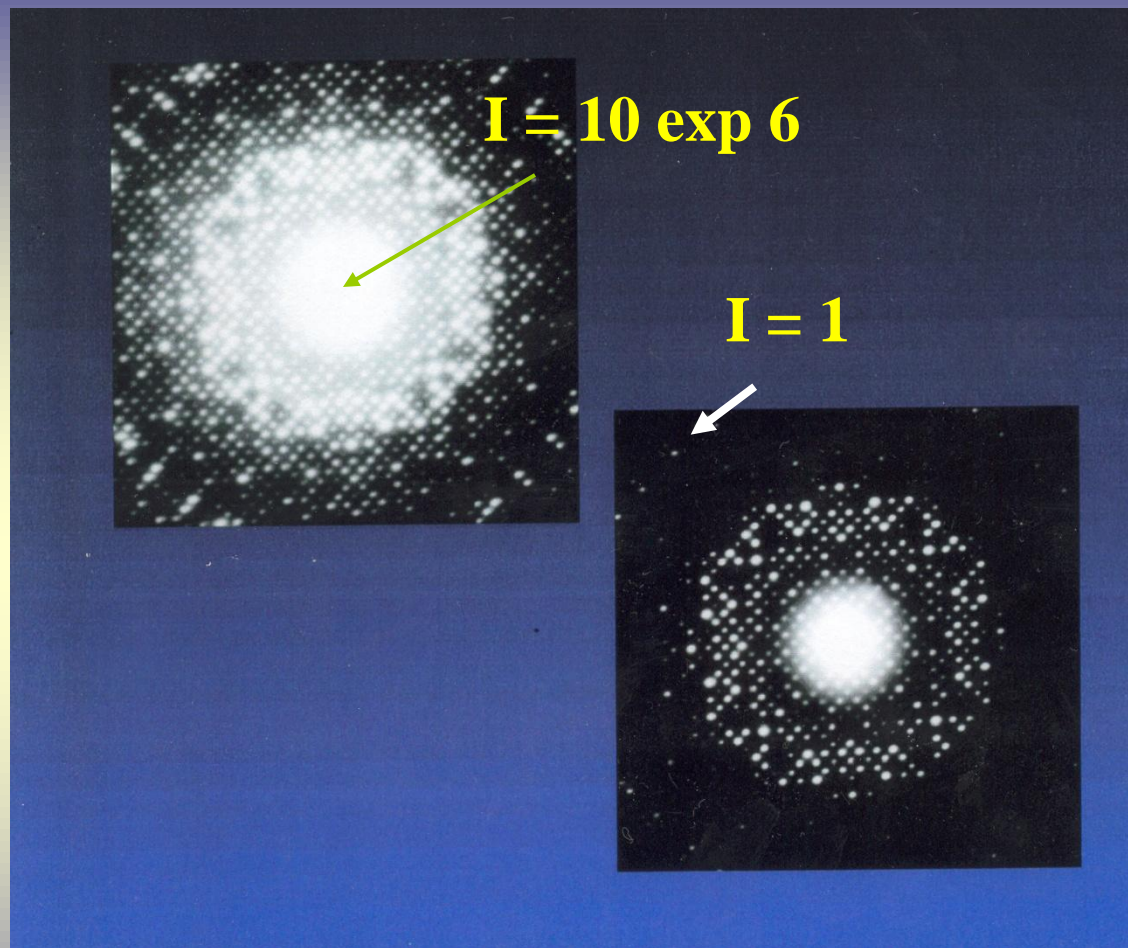


Electron Diffractometer

.... The link between atomic structure and physical properties



MEASURING ED INTENSITIES : $> 10^6$ DYNAMIC RANGE

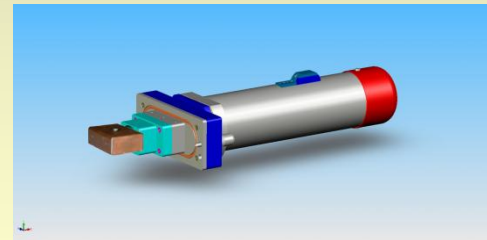
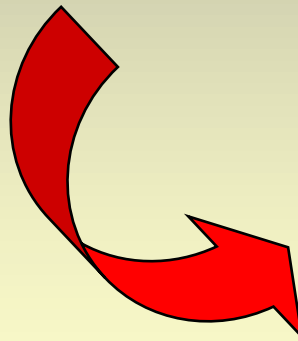


LIKE IN X - RAY CRYSTALLOGRAPHY FOR ELECTRON DIFFRACTION
STRUCTURE DETERMINATION ALL REFLECTIONS MUST BE MEASURED
WITH HIGH PRECISION

How measure *electron diffraction intensities* ?



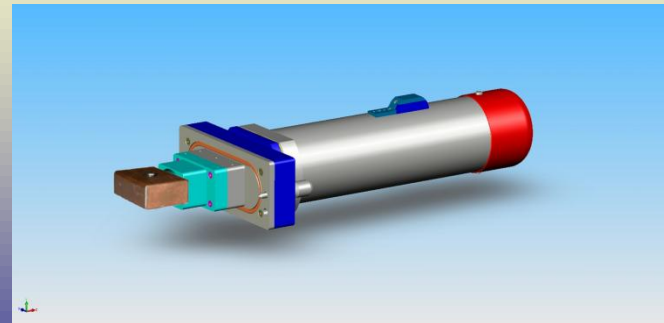
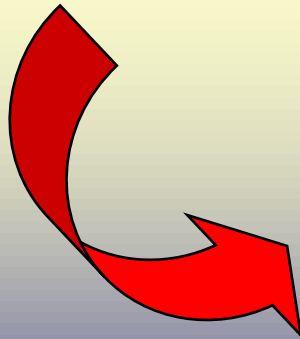
NEW dedicated electron diffractometer for PRECISE and reliable collection of electron diffraction intensities



How measure electron diffraction intensities ?

ED pattern is scanned pixel by pixel with a dedicated unit through a specially designed point ultra-sensitive detector

System able to detect 24 bit intensity (16.000.000 grey levels) linearly and without saturation.



VARIABLE RESOLUTION SCANNING STEPS

MAXIMUM DIFFRACTION PATTERN RESOLUTION 4k x 4k

The screenshot displays the NanoDrive software interface for a file named 'DiffOnGold02.ndr'. The main window shows a diffraction pattern with a central bright spot and surrounding rings. A green circle highlights a region of the pattern, with a green arrow pointing to a smaller, higher-resolution inset labeled '2k x 2k resolution'. A red arrow points to the outer edge of the main pattern, labeled '512 x 512 resolution'. On the left, a 'View Preferences' panel includes sliders for Brightness, Contrast, Scaling, and Log. Below it is a small inset showing a zoomed-in view of the diffraction spots. At the bottom left, there is a larger, more detailed inset of the diffraction pattern. The NanoMEGAS logo and tagline 'Advanced Tools for electron diffraction' are visible in the bottom right corner. The Windows taskbar at the bottom shows several open applications, including 'D:\DiffractULB', 'C:\Daniel\Diffract...', 'Microsoft Excel - ...', and 'Jasc Paint'.

MEASURE TRUE ELECTRON DIFFRACTION INTENSITY

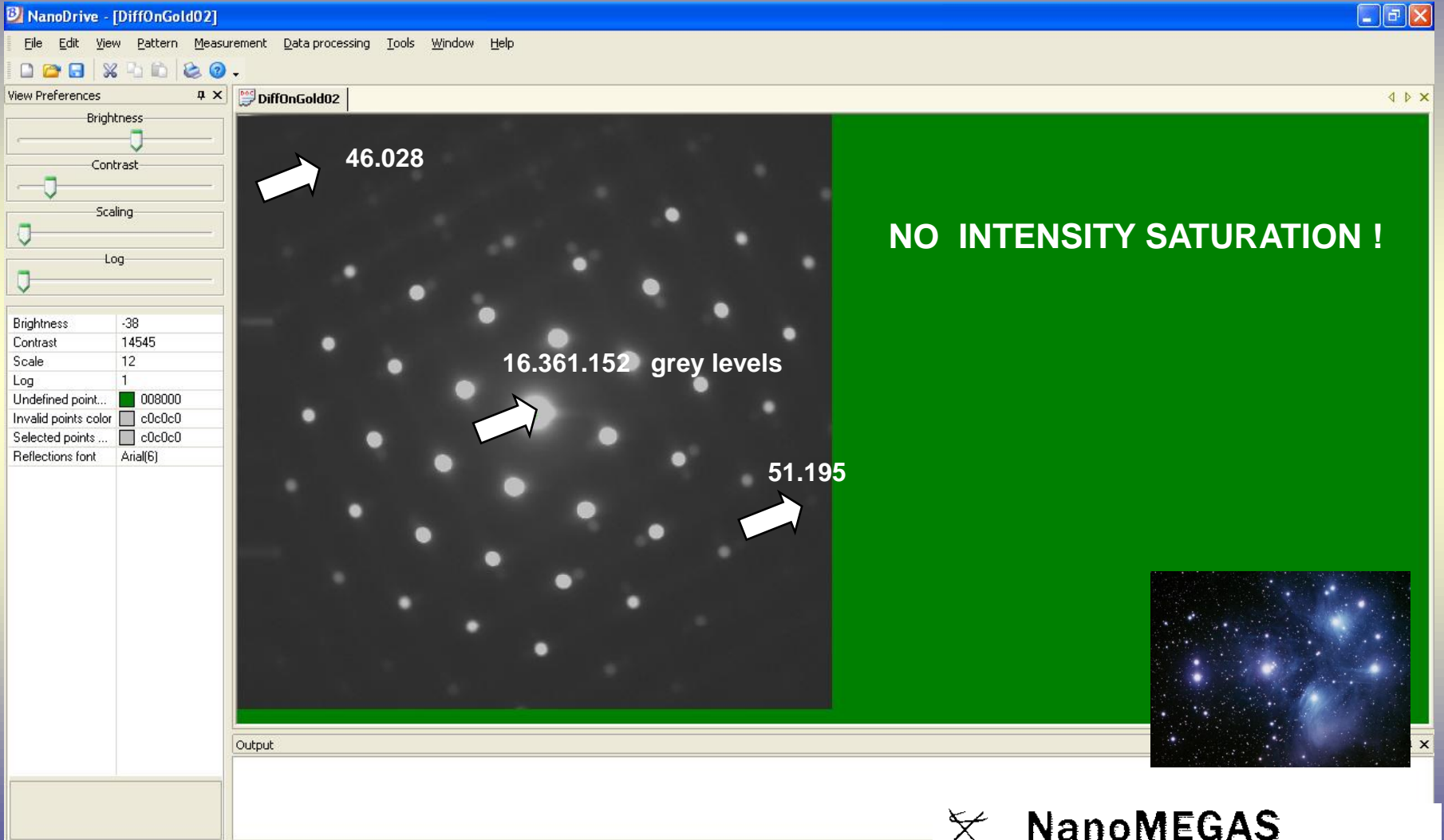
The image displays the NanoDrive software interface for electron diffraction data processing. The main window, titled "NanoDrive - [DiffOnGold02.ndr]", features a menu bar (File, Edit, View, Pattern, Measurement, Data processing, Tools, Window, Help) and a toolbar. The "View Area" contains a diffraction pattern with a green circle highlighting a region. A "View Preferences" panel on the left includes sliders for Brightness, Contrast, Scaling, and Log. A smaller inset window shows a zoomed-in view of the diffraction pattern with a green square highlighting a specific spot. A "Creating new account" dialog box is open in the foreground, showing scanning settings such as Mode (Averaging), Clipping mode, Sampling rate, and Scanning Speed. The Windows taskbar at the bottom shows the NanoDrive application and other open programs like Microsoft Excel and Jasc Paint Shop P... The system tray displays the date and time as 21:09.

**intensity scan
combining precession**

no intensity saturation

**true average intensity from special electrometer
Faraday cage**

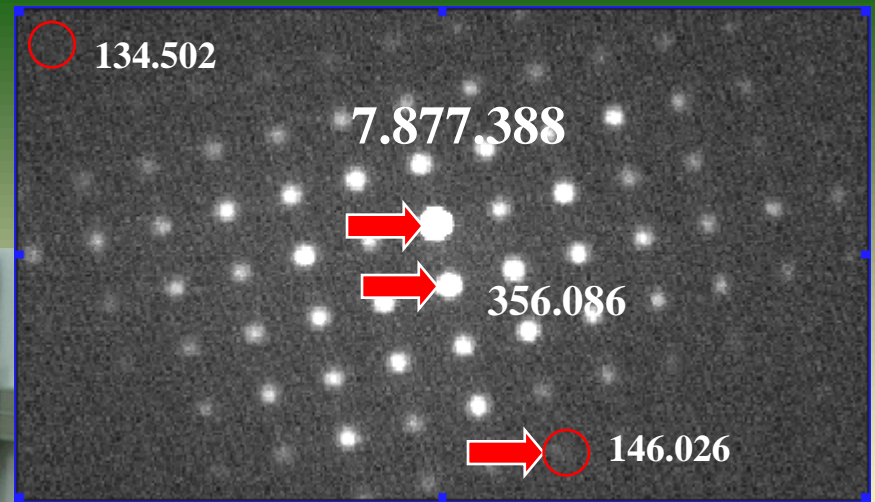
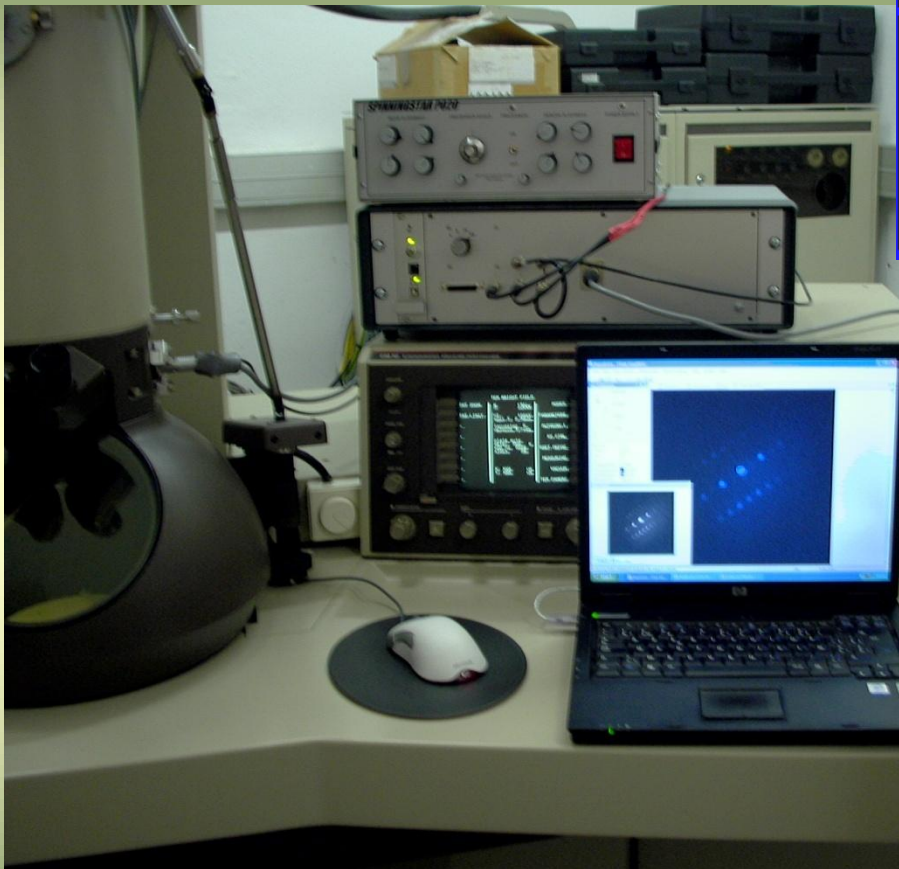
ULTRA- HIGH DYNAMIC RANGE 24 BIT = 16.777.216 grey levels AT ONE SHOT



NanoMEGAS
Advanced Tools for electron diffraction

Performing POINT INTENSITY analysis with radius 10: 16640262

Comparison CCD – Electron diffractometer



**Electron diffractometer 24 bit
16.000.000 grey levels**

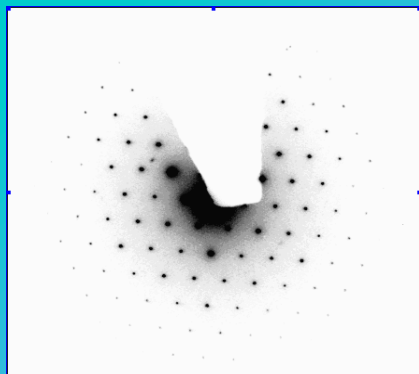


CCD 12 bit 4096 grey levels

COMPARISON CCD camera – Electron diffractometer Pleiades

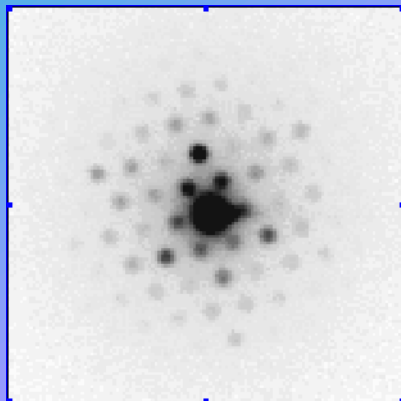
example : $\text{Ca}_{12}\text{Al}_{14}\text{O}_{33}$ [1 1 1] mayenite cubic garnet $a=1.198$ nm

12 bit (4096 grey levels) CCD camera ----- 24 bit (16.000.000 grey levels) electron diffractometer

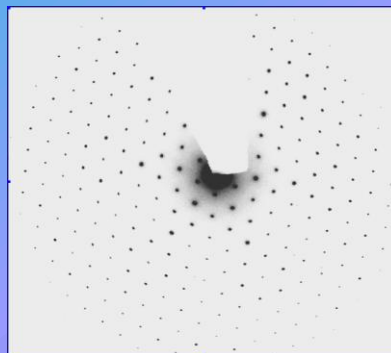


R_{merge}
kinemat -SAED = 54 %
 $R_{\text{merge, internal}}$ = 34.8%

NO Precession

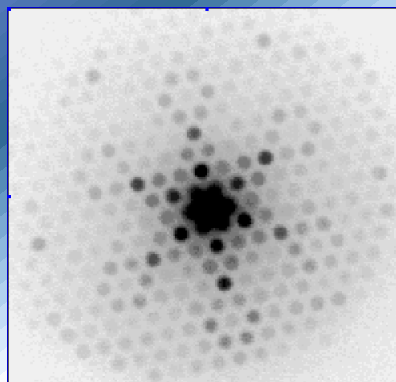


R_{merge}
kinemat -SAED = 44%
 $R_{\text{merge, internal}}$ = 32.3%



R_{merge}
kinemat-precession = 29.5%
 $R_{\text{merge internal}}$ = 23.9%

Precession



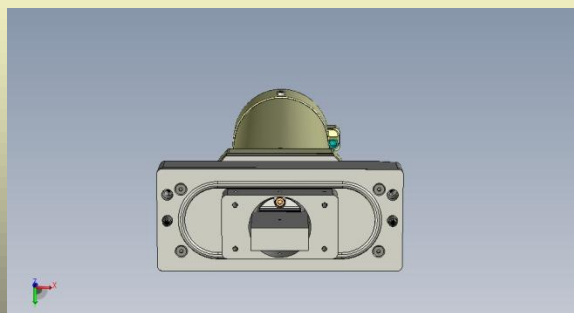
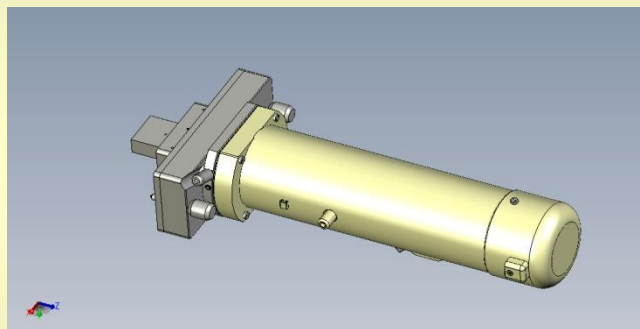
R_{merge}
kinemat-precis = 21%
 $R_{\text{merge, internal}}$ = 14.7%



Modular design 35 mm port DETECTOR housing

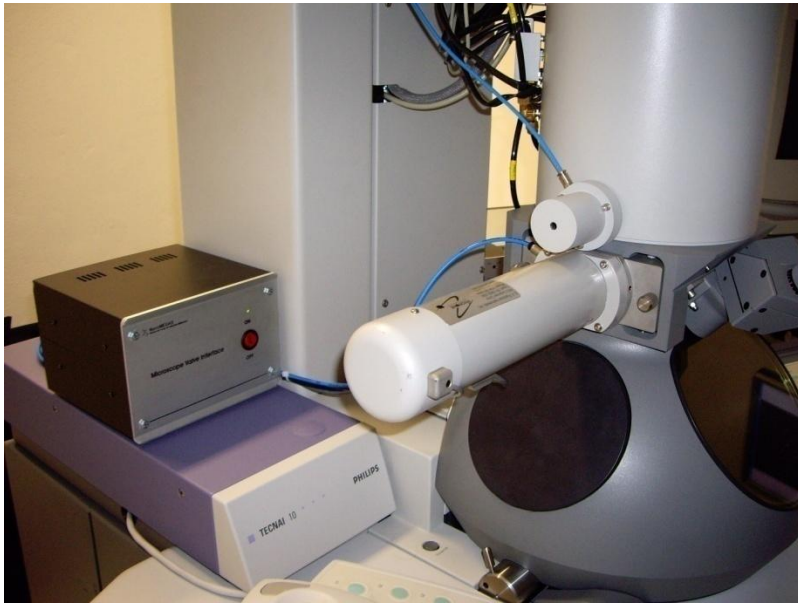
by Fischione Inc

**compatible with 35 mm port HAADF detector
FEI , Jeol ...**



NanoMEGAS
Advanced Tools for electron diffraction





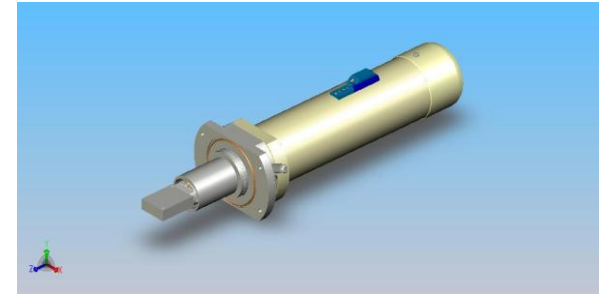
« Spinning Star » + Electron diffractometer
+ Fischione interface installed at

EM400, CM12, Tecnai 10

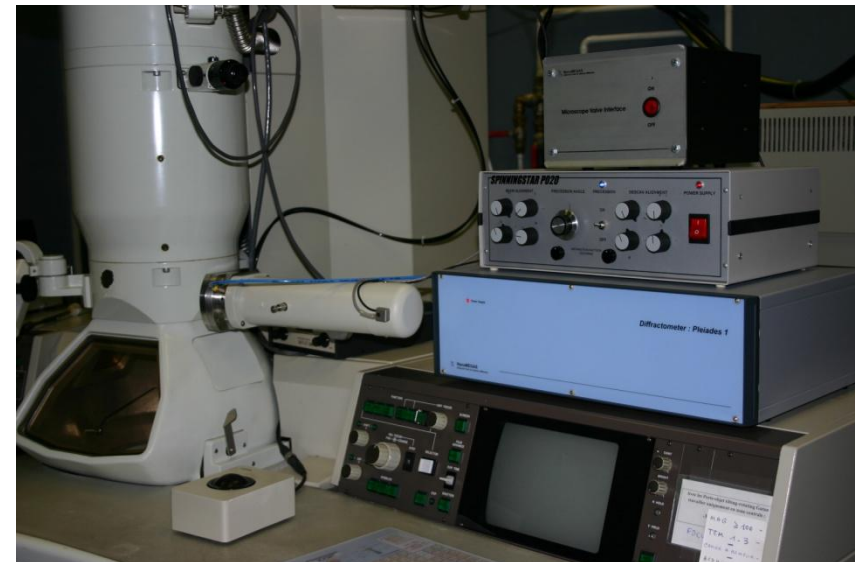


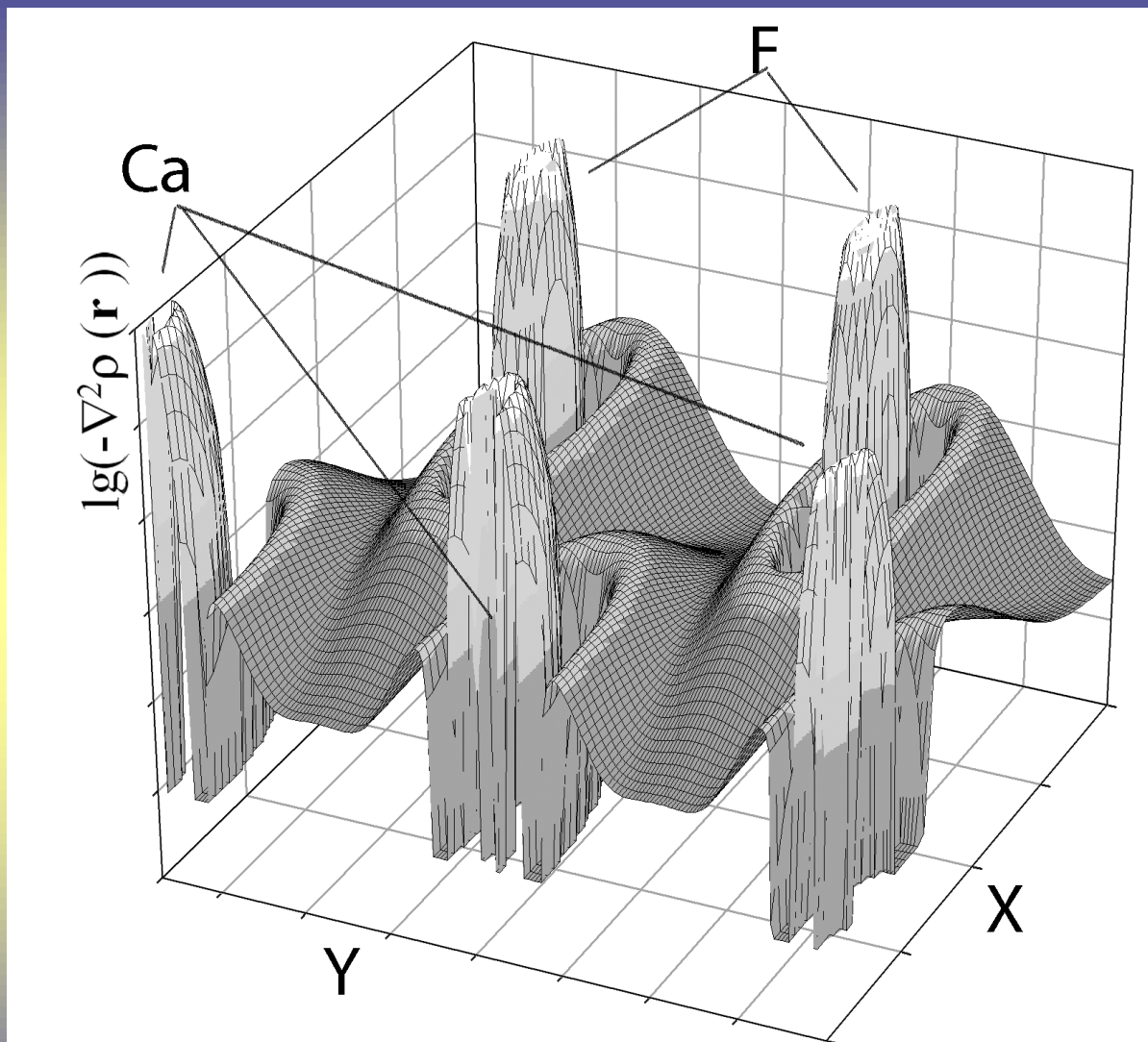
small box with on/off switch
to insert Megaview CCD camera





**« Spinning Star » + Electron diffractometer
+ Fischione interface installed at
JEOL 2100, JEOL 2010 , JEOL 2000**

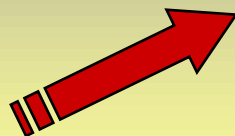
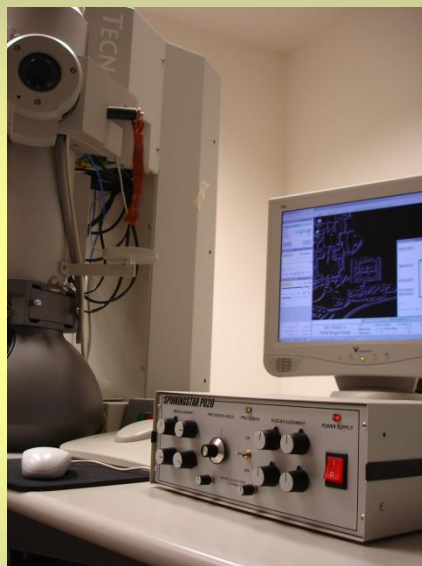




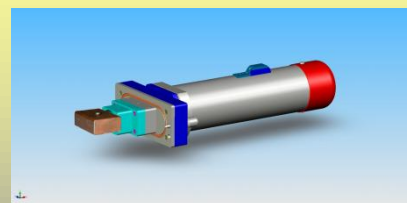
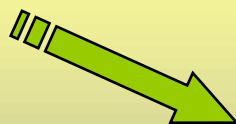
Laplacian electron density distribution $-\nabla^2\rho(\mathbf{r})$ along (110) plane of CaF_2

NEW tools for your TEM...

TEM



PRECSSION UNIT



ELECTRON
DIFFRACTOMETER

EDS

EELS

STEM

CCD

HAADF

