jems is fully written in the java programming language and exploits the power of multi-core CPU.

It also supports the 230 crystallography space-groups and atomic scattering form factors from main sources.

A crystallographic calculator simplifies crystallographic calculations of any crystal system.

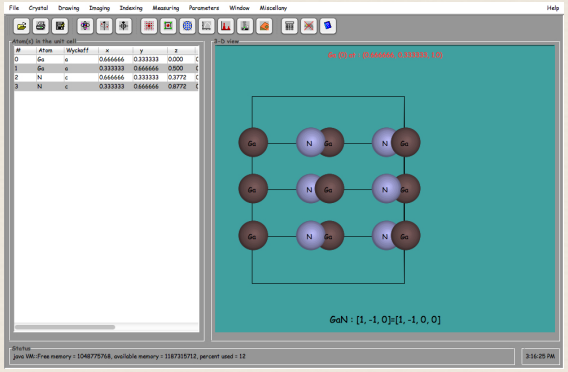
It allows to transform unit cells and define large super-cells and display them using OpenGL.

SAED including Kikuchi and/or HOLZ lines and variant precipitates or twins can be plotted.

HRTEM images are calculated using either the Bloch wave, Howie-Whelan or FFT multistislice methods.

HAADF images are calculated using various approximations including the Frozen lattice method.

FEATURES



jems allows to calculate:
diffraction patterns both kinematical and dynamical:
- SAED,
- CBED and LACBED,
- Precession,
- Powder.

High resolution TEM:
- images & maps.

HAADF images.

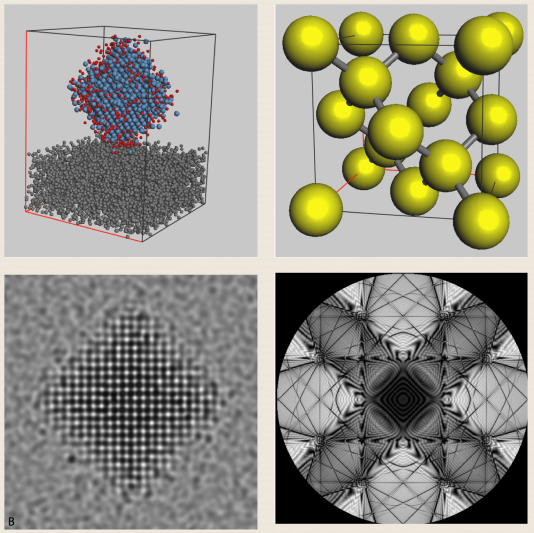
jems helps you:
- index SAED patterns,
- measure crystal thickness,
- measure CCD camera MTF.

JEMS / Pierre Stadelmann

Chenin Rouge 15
CH-1805 Jongny
Switzerland

JEMS

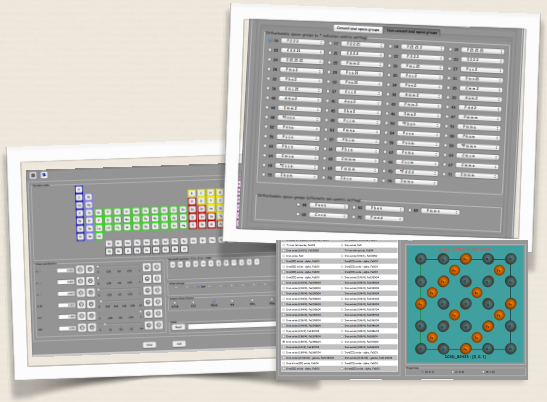
A program for the simulation of images and diffraction patterns in electron microscopy.



jems: java-EMS is available for:
MacOS-X,
Windows XP or later,
Linux.

Licensing information:
info@jems-swiss.ch
jems-swiss@gmail.com

EXAMPLES



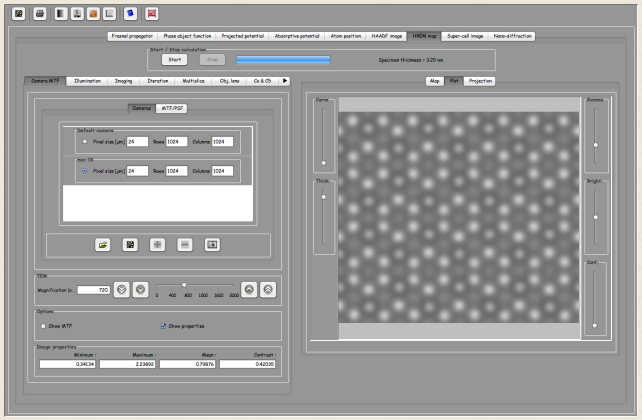
Many dialogues help define or load crystal structures.

jems comes in two versions:

-student edition that can be freely download and offers a limited number of predefined crystal structures.

-full version that is licensed and can load crystal structures for several data base, ICSD, COD or AMS.

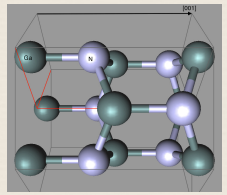
Both versions allows many interactive HRTEM or HRSTEM image simulation.



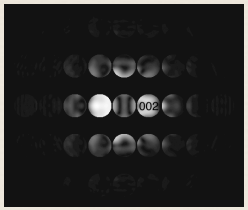
jems student edition (freely downloadable) is available at: Student edition

POLARITY DETERMINATION

Polarity of non-polar crystals like GaN is important for crystal growth. It can be determined experimentally by several TEM or STEM methods such as Convergent Beam Electron Diffraction where experimental patterns are compared to simulated.



[2,1,0] projection of GaN crystal model.

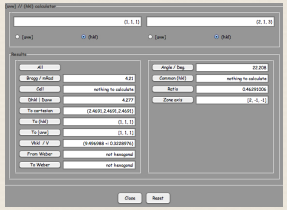


Simulated GaN [2,1,0] CBED pattern.

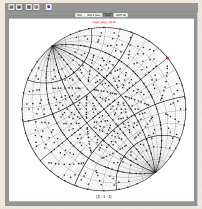
UTILITIES

A calculator simplifies crystallographic calculations between [uvw] directions or (hkl) planes.

Stereographic projections and Wulf diagrams plots allow easy trace analysis or HRTEM - SAED diffraction rotation alignment.



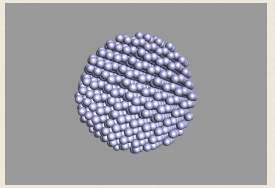
Crystallographic calculator.



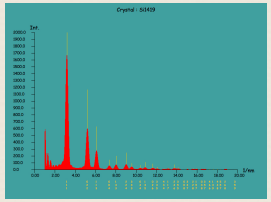
[uvw] Stereogram with superimposed Wulf diagram.

POWDER DIFFRACTION

Using the Debye formula, jems simulates powder patterns that can be compared with simpler kinematical calculations. Models with several tens of thousand atoms are simulated quickly on multi-core computers. Calculated electron powder patterns can be compared to patterns from X-Ray or neutron diffraction.



Model Si particle.



Calculated powder pattern of model Si particle.