**Crystallographic applets and simulations**

This site is dedicated to the teaching of crystallography and was developed at the EPFL in Lausanne (Switzerland). It was first developed by Wes Hardaker and further extended by Nicolas Schoeni under the responsibility of Prof. G. Chapuis. Recently, all the applets have been updated by Nicolas Casademont et Maria Sisto.

(may be here we should mention anything about the Java software and platforms)

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| **Symmetry** | |
| **500 SSD:Users:gchapuis:Desktop:Capture d’écran 2016-03-28 à 12.37.15.png** | **Initiation to the discovery of point symmetry groups**  (Insert a download button for the applet)  An applet to explore the point group symmetry of platonic and other polyhedra. In particular, rotations, inversion and combinations of them can be simulated. |
| **500 SSD:Users:gchapuis:Desktop:Capture d’écran 2016-03-28 à 13.16.52.png** | **Escher Web Sketch 2**  (Insert a download button for the applet)  An applet to simulate any periodic pattern corresponding to one of the 17 possible two-dimensional symmetry groups (17 planar groups).  More info (link to index\_escher.html) |
| **500 SSD:Users:gchapuis:Desktop:Capture d’écran 2016-03-28 à 12.31.29.png** | [**crystalOgraph**](http://escher.epfl.ch/crystalOgraph)  (Insert a download button for the applet)  An applet to represent any type of crystalline structure given the lattice parameters, the space group and the atomic coordinates of symmetry independent atoms. It is also possible to import directly a structure from the ICSD database or from a CIF file.  More info (link to index\_crystalOgraph.html) |
| **500 SSD:Users:gchapuis:Desktop:Capture d’écran 2016-03-28 à 12.28.18.png** | [**cellConverter**](http://escher.epfl.ch/cellConverter/)    (Insert a download button for the applet)  An applet to transform any unit cell ant its content to another cell. Based on the original CIF file, the applet generates a new CIF file resulting from the transformation specified by the user. |
| **Diffraction** | |
| **500 SSD:Users:gchapuis:Desktop:Capture d’écran 2016-03-28 à 13.23.30.png** | [**Bragg scattering**](http://escher.epfl.ch/Bragg/)  (no need to download, go directly to the flash app)  A Flash animation to illustrate constructive or destructive interferences as expressed by Bragg's law |
| **500 SSD:Users:gchapuis:Desktop:Capture d’écran 2016-03-28 à 12.25.00.png** | **Reciprocal lattice generator**  (download or URL ?)  From a periodic diagram generated by Escher Web Sketch, the user is guided step by step by the applet in order to create the reciprocal lattice corresponding to the periodicity of the initial periodic pattern. |
| **500 SSD:Users:gchapuis:Desktop:Capture d’écran 2016-03-28 à 16.45.13.png** | **Ewald sphere animation**  (the simulations can be found in the link below)  *Mpeg:* [2.9 MB](diff360.mpeg)  *QuickTime:* [5.1 MB](diff360qt.mov)  Video sequence illustrating the diffraction phenomenon based on the Ewald sphere  More info (index\_Ewald.html) |
| **500 SSD:Users:gchapuis:Desktop:Capture d’écran 2016-03-28 à 12.34.00.png** | **diffractOgram**  (Insert a download button for the applet)  An applet to simulate any type of diffraction pattern based on the Ewald sphere and the reciprocal lattice. In particular, Laue patterns, Debye Scherrer diagrams, rotating crystals and even precession photographs can be generated.  More info (index\_diffractOgram.html) |
| **500 SSD:Users:gchapuis:Desktop:Capture d’écran 2016-03-28 à 12.14.09.png** | **Diffraction and Fourier Transform**  (Insert a download button for the applet)  An applet to calculate the Fourrier Transform of a density function ρ(**x**) yielding the complex magnitude G(**S**). The density function can be either periodic or non-periodic.  The applet is also able to calculate the inverse Fourier transform of G(**S**). Numerous tools can be applied in order to understand the role of amplitudes and phases, which are of particular importance in diffraction phenomena. |
| **500 SSD:Users:gchapuis:Desktop:Capture d’écran 2016-03-28 à 12.35.25.png** | **reciprOgraph**  (Insert a download button for the applet)  An applet to simulate the X-ray diffraction intensities for single crystal in reciprocal space and powder diffraction patterns. Structures can be selected from from CIF files.  More info (index\_reciprOgraph.html) |
| **Structure resolution** | |
| **500 SSD:Users:gchapuis:Desktop:Capture d’écran 2016-03-28 à 12.20.19.png** | [**Charge flipping**](http://escher.epfl.ch/flip/)  An applet to solve the phase problem in diffraction by the charge flipping algorithm. The user can create a 2D crystalline structure and follow the evolution of the algorithm in solving the structure. |