

New 3D crystal models for teaching crystallography

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One of the problems faced by students of Crystallography is the visualisation of 3D symmetry elements of the 32 Crystal Classes. In the practical seminars of our Crystallography courses at the Complutense University of Madrid, students use wooden models to determine their symmetry. However, students cannot take these models home to continue the study of the symmetry elements outside the classroom. This is because the collections of crystallographic models that we use are very old and it is very difficult to find artisans who make new wooden models in case of loss or deterioration. To overcome these problems, i.e. the need of models to work at home and the deterioration of our collections models, we decided to use a 3D design software to make crystallographic models that students can visualise on a computer, tablet or mobile phone. Furthermore, taking advantage of the falling costs of 3D printers, we designed these models with the idea of making them easily printable by the students for their personal use at home or by teachers to create new collections of three-dimensional models belonging to the 32 Crystal Classes (see Figure 1). To date, we have created more than 100 models, which have been classified according to their point symmetry on the website <https://crystalmodels3d.wordpress.com> (downloading these models is free of charge). The next step in our teaching project is the design of three-dimensional models of mineral structures to study the symmetry elements of the 230 Space Groups. This will require a further effort to create models that are easily understandable and, most importantly, 3D printable.

