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## Landyne, a software suite for electron diffraction simulation and crystallographic analysis

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Landyne software suite is the 2.0 version of the previous JEC— a Java Electron Crystallography Project. The software suite currently includes eight stand-alone computer programs. Each of them was designed for one topic of application in electron diffraction simulation, crystallographic analysis or experimental data processing and quantification. Figure 1 shows the classification of the computer programs in the Landyne suite according to their functionality. The computer programs have been grouped into a suite to increase the total usefulness and a launcher has been developed for the users to conveniently access all of the computer programs. The purpose of this software suite is twofold: i) as research tools to analyze experimental results, ii) as teaching tools to show students the principles of electron diffraction and crystallography. The software suite was programmed using Java SE Development Kit 8. It has been successfully tested on Microsoft Windows 7, 8 and 10 with a Java virtual machine, i.e. Java 2 Runtime Environment (J2RE). The executable codes, user manuals and a set of crystal structural data are available at <http://www.unl.edu/ncmn-cfem/xzli/computer- programs>. The design and functions of the computer programs will be elucidated in this presentation. Three examples are listed here: SAED is used for simulation and analysis of electron diffraction patterns including twins and two phases with a fixed orientation and the search for the zone axes of experimental patterns; SPICA is for the calculation of stereograms and related applications; LAUNCE is for lattice reconstruction and unit cell determination of unknown crystal phases in TEM experiments. The application of the Landyne suite in our recent research works will be also discussed.

<http://www.unl.edu/ncmn-cfem/xzli/computer- programs>

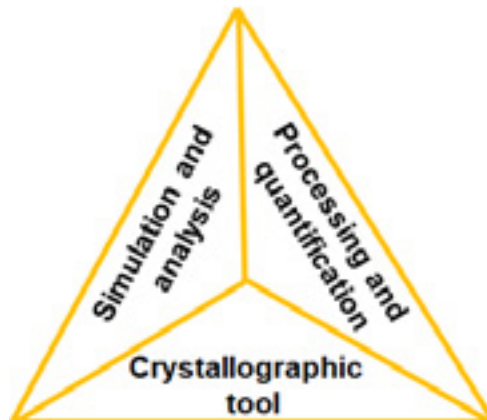


Figure 1: The classification of the computer programs in the Landyne suite according to their functionality and the relationship among the three subgroups.

### Biography

Xing-Zhong Li has his expertise in transmission electron microscopy on materials and nanoscience. He started the works on computer programs for electron diffraction simulation and crystallographic analysis a decade ago. He works in Nebraska Center for Materials and Nanoscience, University of Nebraska.

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