Update to „Using Free/Libre and Open Source Software in the Geological Sciences“

This is an updated list of FLOSS that might be useful in the geological sciences. The original list was published in our article in the *Austrian Journal of Earth Sciences*:

Mader, D., Schenk, B. (2017) Using Free/Libre and Open Source Software in the Geological Sciences. Communication of the Society. Austrian Journal of Earth Sciences 110/1, 133-152. [http://dx.doi.org/10.17738/ajes.2017.0010](http://dx.doi.org/10.17738/ajes.2017.0010)

That article has no active hyperlinks, and as the tables are images the presented links can also not copied and pasted out of the online pdf-version. Thus, this addendum lists again all the links of the article for easier access. In addition to the existing categories we list here also FLOSS and scripts which depends on proprietery software (e.g., Excel, Matlab). Currently, we do not collect information about apps for mobile devices. We still focus on the usage of desktop applications in offices.

This addendum will be updated from time to time as always new interesting software is created. The selection is, however, a subjective one and should never be regarded as a complete compilation of all available software. We just intend to show the variety of available interesting Free/Libre and Open Source Software for the Geological Sciences. Contrary to the article in AJES we do not indicate on which platforms the listed software will work – this information is given on the individual websites or articles about the programs.

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A selection of alternative software of usually mostly used software programs

This is a list of generally used software such as an office suite, graphic editors etc. Also free proprietary closed software is included; some of that freeware might only be used for non-commercial or academic purposes.

| **Office Suite: alternatives to MS Office ...** |
|-----------------------------------------------|
| Calligra                                      | https://www.calligra.org/ |
| LibreOffice                                   | http://www.libreoffice.org/ |
| OnlyOffice                                    | https://www.onlyoffice.com/apps.aspx |
| OpenOffice                                    | http://www.openoffice.org/ |
| Softmaker FreeOffice                          | http://www.freeoffice.com/ |
| WPS Office                                    | http://www.wps.com/ |

| **Email; Project management: alternatives to MS Outlook; MS Project ...** |
|-------------------------------------------------------------------------|
| Claws Mail                                                               | http://www.claws-mail.org/ |
| EssentialPIM                                                             | http://www.essentialpim.com/ |
| Evolution                                                                | https://wiki.gnome.org/Apps/Evolution |
| GanttProject                                                              | http://www.ganttproject.biz/ |
| Lightning Calendar                                                       | https://www.mozilla.org/en-US/projects/calendar/ |
| Opera Mail                                                               | http://www.opera.com/computer/mail |
| ProjectLibre                                                             | http://www.projectlibre.org/ |
| SeaMonkey                                                                 | http://www.seamonkey-project.org/ |
| Thunderbird                                                               | https://www.mozilla.org/en-US/thunderbird/ |

| **Portable Document Format: alternatives to Adobe Acrobat ...** |
|----------------------------------------------------------------|
| Adobe Reader                                                               | http://get.adobe.com/de/reader/otherversions/ |
| Foxit Reader                                                               | http://www.foxitsoftware.com/Secure_PDF_Reader |
| Master PDF Editor                                                          | https://code-industry.net/free-pdf-editor/ |
| PDFCreator                                                                 | http://www.pdfforge.org/pdfcreator |
| PDFsam                                                                     | http://www.pdfsam.org/ |
| PDF Shaper                                                                 | http://www.glorylogic.com/pdf-shaper.html |
| PDF-Xchange Editor                                                         | https://www.tracker-software.com/product/pdf-xchange-editor |
| Sumatra                                                                    | http://www.sumatrapdfreader.org/ |
| Tabula                                                                     | https://tabula.technology/ |

| **Raster graphics: alternatives to Adobe Photoshop, Corel Photopaint ...** |
|----------------------------------------------------------------------------|
| Artweaver                                                                  | http://www.artweaver.de/en |
| Darktable                                                                  | http://www.darktable.org/ |
| Fiji                                                                       | http://fiji.sc/ |
| GIMP                                                                       | http://www.gimp.org/ |
| ImageJ                                                                     | http://imagej.net/ |
| ImageMagick                                                                | http://www.imagemagick.org/ |
| IrfanView                                                                  | https://www.irfanview.com/ |
| Krita                                                                      | https://krita.org |
| Paint.NET                                                                  | http://www.getpaint.net/index.html |
| Vector graphics: alternatives to Adobe Illustrator, Corel Draw ... |
| --- |
| Dia | https://wiki.gnome.org/Apps/Dia |
| (Open/LibreOffice) Draw | see links above (Office) |
| Gravit Designer | https://www.designer.io/ |
| Inkscape | http://www.inkscape.org/ |
| (Calligra) Karbon | see link above (Office) |
| sK1 | http://sk1project.net/ |
| Sozi | http://sozi.baierouge.fr/ |
| yEd Graph Editor | http://www.yworks.com/products/yed |
| Vectr | https://vectr.com/ |

| Computer Aided Design: alternatives to AutoCAD ... |
| --- |
| BRL-CAD | http://brlcad.org/ |
| FreeCAD | http://www.freecadweb.org/ |
| LibreCAD | http://librecad.org/cms/home.html |
| OpenSCAD | http://www.openscad.org/ |
| QCAD | http://www.qcad.org/ |
| Salome | http://www.salome-platform.org/ |
| SolveSpace | http://solvespace.com/ |
| Teigha File Converter | https://www.opendesign.com/guestfiles/TeighaFileConverter |

| Database systems: alternatives to Oracle Database, MSSQL Server, MS Access ... |
| --- |
| Apache Derby | https://db.apache.org/derby/ |
| Firebird | http://www.firebirdsql.org/ |
| (Open/LibreOffice) Base | see links above (Office) |
| MariaDB | https://mariadb.org/ |
| MS SQL Server Express | https://www.microsoft.com/en-au/sql-server/sql-server-editions-express |
| MySQL Community Edition | https://www.mysql.de/ |
| PostgreSQL | https://www.postgresql.org/ |
| SQLite | https://sqlite.org/ |

| Reference manager: alternatives to EndNote, ProCite ... |
| --- |
| Bibus | http://bibus-biblio.sourceforge.net |
| Colwiz | https://www.colwiz.com |
| Docear | http://www.docear.org/ |
| KbibTeX | http://home.gna.org/kbibtex/cran.r |
| JabRef | http://jabref.sourceforge.net/ |
| MayLib                       | http://paleopolis.rediris.es/cg/1506/ |
|----------------------------|--------------------------------------|
| Mendeley                    | http://www.mendeley.com/             |
| Qigga                       | http://www.qigga.com/                |
| ReadCube                    | https://www.readcube.com/            |
| Zotero                      | https://www.zotero.org/              |

**GIS and Remote Sensing:** alternatives to ArcGIS, IDRISI, ENVI, ERDAS Imagine ...

| DIVA-GIS                    | http://www.diva-gis.org/             |
|-----------------------------|--------------------------------------|
| efoto                       | http://www.efoto.eng.uerj.br/en      |
| GRASS                       | http://grass.osgeo.org/              |
| gvSIG                       | http://www.gvSIG.com/en              |
| ILWIS                       | http://www.ilwis.org/                |
| KOSMO                       | http://www.opengis.es/               |
| Map Window                  | http://www.mapwindow.org/            |
| OpenEV                      | http://openev.sourceforge.net/       |
| OpenJump                    | http://jump-pilot.sourceforge.net/   |
| Opticks                     | https://www.opticks.org/             |
| OSSIM                       | http://trac.osgeo.org/ossim/         |
| PolSARpro                   | https://earth.esa.int/web/polsarpro  |
| QGIS                        | http://qgis.org/                     |
| SAGA                        | http://www.saga-gis.org/             |
| uDig                        | http://udig.refractions.net/         |

**Numeric/symbolic computations, statistics, data analysis, data visualization:** alternatives to Mathematica, Matlab, SigmaPlot, Origin, SPSS ...

| Anaconda                    | https://www.continuum.io/why-anaconda |
|-----------------------------|--------------------------------------|
| DataExplore                 | http://dmnfarrell.github.io/pandatable/ |
| DataMelt                    | http://jwork.org/dmelt/               |
| Enthought Canopy Express    | https://www.enthought.com/products/epd/free |
| Fityk                       | http://fityk.nieto.pl/                |
| FreeMat                     | http://freemat.sourceforge.net/      |
| GNU Data language (GDL)     | http://gnudatalanguage.sourceforge.net/ |
| Gnumeric                    | http://www.gnumeric.org/             |
| GnuPlot                     | http://www.gnuplot.info/             |
| GGobi                       | http://www.ggobi.org                 |
| JASP                        | https://jasp-stats.org/              |
| Julia                       | http://julialang.org/                |
| JupyterLab                  | https://jupyterlab.readthedocs.io/    |
| KNIME                       | https://www.knime.com/               |
| LabPlot                     | http://labplot.sourceforge.net/      |
| Mathics                     | http://www.mathics.org/              |
| Maxima                      | http://maxima.sourceforge.net/       |
| Software   | Website                                      |
|------------|----------------------------------------------|
| Mondrian   | [http://www.theusrus.de/Mondrian/](http://www.theusrus.de/Mondrian/) |
| Octave     | [https://www.gnu.org/software/octave](https://www.gnu.org/software/octave) | [http://octave-online.net/](http://octave-online.net/) |
| Orange     | [http://orange.biolab.si/](http://orange.biolab.si/) |
| PSPP       | [https://www.gnu.org/software/pspp](https://www.gnu.org/software/pspp) |
| PySpread   | [https://manns.github.io/pyspread/](https://manns.github.io/pyspread/) |
| Python(x,y) | [http://python-xy.github.io/](http://python-xy.github.io/) |
| Qtiplot (free only version < 0.9.8.9) | [http://www.qtiplot.com/](http://www.qtiplot.com/) (Ubuntu Software Center etc) |
| R          | [http://cran.r-project.org/](http://cran.r-project.org/) |
| RLPlot     | [http://rlplot.sourceforge.net/](http://rlplot.sourceforge.net/) |
| RStudio    | [https://rstudio.com/](https://rstudio.com/) |
| SageMath   | [http://www.sagemath.org/](http://www.sagemath.org/) |
| SciDAVis   | [http://scidavis.sourceforge.net/](http://scidavis.sourceforge.net/) |
| Scilab     | [http://www.scilab.org/](http://www.scilab.org/) |
| Spyder     | [https://github.com/spyder-ide/spyder](https://github.com/spyder-ide/spyder) |
| Veusz      | [https://veusz.github.io/](https://veusz.github.io/) |
| WinPython  | [https://winpython.github.io/](https://winpython.github.io/) |

**Word processing:** alternatives to MS Word; Writer ...

| Software   | Website                                      |
|------------|----------------------------------------------|
| Abiword    | [http://www.abiword.org/](http://www.abiword.org/) |
| LyX        | [http://www.lyx.org/](http://www.lyx.org/) |
| TeXMacs    | [http://www.texmacs.org/](http://www.texmacs.org/) |
| Package         | Description                                                                 | Website                                      |
|-----------------|------------------------------------------------------------------------------|----------------------------------------------|
| aqp             | Algorithms for Quantitative Pedology                                         | [https://CRAN.R-project.org/package=aqp](https://CRAN.R-project.org/package=aqp) (Beaudette et al., 2013) |
| analogue        | Analogue and Weighted Averaging Methods for Palaeoecology                   | [http://CRAN.R-project.org/package=analogue](http://CRAN.R-project.org/package=analogue) (Simpson, 2007) |
| ArArRedux       | Rigorous Data Reduction and Error Propagation of Ar40 / Ar39 Data           | [http://CRAN.R-project.org/package=ArArRedux](http://CRAN.R-project.org/package=ArArRedux) (Vermeech, 2015) |
| astrochron      | A Computational Tool for Astrochronology                                    | [http://CRAN.R-project.org/package=astrochron](http://CRAN.R-project.org/package=astrochron) |
| ClamR           | Time Series Modeling for Climate Change Proxies                             | [http://CRAN.R-project.org/package=ClamR](http://CRAN.R-project.org/package=ClamR) (Wang et al., 2015) |
| CoinCalc        | Event Coincidence Analysis                                                   | [https://github.com/JonatanSiegmund/CoinCalc](https://github.com/JonatanSiegmund/CoinCalc) (Siegmund et al., 2017) |
| compositions    | Compositional Data Analysis                                                 | [https://CRAN.R-project.org/package=compositions](https://CRAN.R-project.org/package=compositions) |
| detzrcr         | Compare Detrital Zircon Suites                                               | [https://CRAN.R-project.org/package=detzrcr](https://CRAN.R-project.org/package=detzrcr) |
| diffractometry  | Baseline identification and peak decomposition for x-ray diffractograms      | [https://CRAN.R-project.org/package=diffractometry](https://CRAN.R-project.org/package=diffractometry) (Davies et al., 2008) |
| ElementR        | A Set of R6 Classes & a Shiny Application for Reducing Elemental LA-ICPMS Data from Solid Structures | [https://CRAN.R-project.org/package=elementR](https://CRAN.R-project.org/package=elementR) (Sirot et al., 2017) |
| EMMAgeo         | End-Member Modelling of Grain-Size Data                                      | [http://CRAN.R-project.org/package=EMMAgeo](http://CRAN.R-project.org/package=EMMAgeo) |
| eseis           | Environmental Seismology Toolbox                                            | [https://CRAN.R-project.org/package=eseis](https://CRAN.R-project.org/package=eseis) (Dietze, 2018) |
| FactoMineR      | Multivariate Exploratory Data Analysis and Data Mining                      | [https://CRAN.R-project.org/package=FactoMineR](https://CRAN.R-project.org/package=FactoMineR) (Lê et al., 2008) |
| forams          | Foraminifera and Community Ecology Analyses                                 | [http://CRAN.R-project.org/package=forams](http://CRAN.R-project.org/package=forams) |
| fossil          | Palaeoecological and Palaeogeographical Analysis Tools                      | [http://CRAN.R-project.org/package=fossil](http://CRAN.R-project.org/package=fossil) (Vavrek, 2011) |
| G2Sd            | Grain-Size Statistics and Description of Sediment                           | [https://CRAN.R-project.org/package=G2Sd](https://CRAN.R-project.org/package=G2Sd) (Fournier et al., 2014) |
| GcClust         | Clustering of regional geochemical data                                     | [https://pubs.er.usgs.gov/publication/tm7C13](https://pubs.er.usgs.gov/publication/tm7C13) (Ellefson and Smith, 2016) |
| geoknife        | Web-Processing of Large Gridded Datasets                                    | [https://CRAN.R-project.org/package=geoknife](https://CRAN.R-project.org/package=geoknife) (Read et al., 2016) |
| geologyGeometry |                                                                      | [http://www.joshuadavis.us/software/index.html](http://www.joshuadavis.us/software/index.html) |
| geomorph        | Geometric Morphometric Analyses of 2D/3D Landmark Data                      | [https://CRAN.R-project.org/package=geomorph](https://CRAN.R-project.org/package=geomorph) (Adams and Otárola-Castillo, 2013) |
| geoscale        | Geological Time Scale Plotting                                              | [http://CRAN.R-project.org/package=geoscale](http://CRAN.R-project.org/package=geoscale) |
| geotech         | Geotechnical Engineering                                                    | [https://CRAN.R-project.org/package=geotech](https://CRAN.R-project.org/package=geotech) |
| ggfortify       | Data Visualization Tools for Statistical Analysis Results                   | [https://CRAN.R-project.org/package=ggfortify](https://CRAN.R-project.org/package=ggfortify) (Yuan et al., 2016) |
| ggmap           | Spatial Visualization with ggplot2                                          | [https://CRAN.R-project.org/package=ggmap](https://CRAN.R-project.org/package=ggmap) (Kahle and Wickham, 2013) |
| ggtern          | An Extension to 'ggplot2', for the Creation of Ternary Diagrams              | [http://CRAN.R-project.org/package=ggtern](http://CRAN.R-project.org/package=ggtern) |
| Package               | Description                                                                 | Website                                                                 | Reference                              |
|----------------------|-----------------------------------------------------------------------------|------------------------------------------------------------------------|----------------------------------------|
| GrapheR              | A Multi-Platform GUI for Drawing Customizable Graphs in R                     | https://CRAN.R-project.org/package=GrapheR (Hervé, 2011)                |
| hydrogeo             | Groundwater data presentation and interpretation                             | http://CRAN.R-project.org/package=hydrogeo                             |
| IsoplotR             | Statistical Toolbox for Radiometric Geochronology                            | http://CRAN.R-project.org/package=IsoplotR (Vermeesch, 2018)            |
| Isoread              | R interface to IRMS file formats typically used in stable isotope geochemistry | https://github.com/sebkopf/isoread                                      |
| KarsTS               | An Interface for Microclimate Time Series Analysis                            | https://CRAN.R-project.org/package=KarsTS (Sáez et al., 2019)           |
| LAND-SE              | LANDslide Susceptibility Evaluation                                          | https://github.com/maurorossi/LAND-SE (Rossi and Reichenbach, 2016)    |
| Luminescence         | Comprehensive Luminescence Dating Data Analysis                               | http://CRAN.R-project.org/package=Luminescence (Kreutzer et al., 2012; Fuchs et al., 2015) |
| MALDquant            | Quantitative Analysis of Mass Spectrometry Data                               | http://strimmerlab/software/maldiquant/ (Gibb and Strimmer, 2012)      |
| matlab               | MATLAB emulation package                                                     | http://CRAN.R-project.org/package=matlab                               |
| marmap               | Import, Plot and Analyze Bathymetric and Topographic Data                    | https://CRAN.R-project.org/package=marmap (Pante and Simon-Bouhet, 2013) |
| measuRing            | Detection and Control of Tree-Ring Widths on Scanned Image Sections           | https://CRAN.R-project.org/package=measuRing (Lara et al. 2015)         |
| NORRRM               | Geochemical Toolkit for R                                                    | http://CRAN.R-project.org/package=NORRRM (González-Guzmán, 2016)      |
| paleobiDB            | Download and Process Data from the Paleobiology Database                     | https://CRAN.R-project.org/package=paleobiDB (Varela et al., 2015)     |
| paleofire            | Analysis of Charcoal Records from the Global Charcoal Database               | https://CRAN.R-project.org/package=paleofire (Blarquez et al. 2014)    |
| paleoMAS             | Paleoecological Analysis                                                     | https://CRAN.R-project.org/package=paleoMAS                             |
| paleotree            | Paleontological and Phylogenetic Analyses of Evolution                       | http://CRAN.R-project.org/package=paleotree (Bapst, 2012)              |
| paleoTS              | Analyze Paleontological Time-Series                                          | https://CRAN.R-project.org/package=paleoTS                               |
| palinsol             | Insolation for palaeclimatic studies                                         | http://CRAN.R-project.org/package=palinsol                               |
| phylogram            | Dendrograms for Evolutionary Analysis                                        | https://CRAN.R-project.org/package=phylogram (Wilkinson and Davy, 2018) |
| provenance           | Statistical Toolbox for Sedimentary Provenience Analysis                    | http://CRAN.R-project.org/package=provenance (Vermeesch et al., 2016) |
| rioja                | Analysis of Quaternary Science Data                                         | https://CRAN.R-project.org/package=rioja                                |
| R.matlab             | Read and Write MAT Files and Call MATLAB from within R                      | https://CRAN.R-project.org/package=R.matlab                             |
| RNetCDF              | Interface to NetCDF Datasets                                                | https://CRAN.R-project.org/package=RNetCDF (Michna and Woods, 2013)    |
| robCompositions      | Robust Estimation for Compositional Data                                    | https://CRAN.R-project.org/package=robCompositions (Templ et al., 2011) |
| RockFab              | Rock fabric and strain analysis tools                                       | http://CRAN.R-project.org/package=RockFab                               |
| shapeR               | Collection and Analysis of Otolith Shape Data                               | http://CRAN.R-project.org/package=shapeR (Libungan and Pálsson, 2015)  |
| Package         | Description                                                                 | CRAN URL                                                                 | Reference                                      |
|-----------------|-----------------------------------------------------------------------------|--------------------------------------------------------------------------|-----------------------------------------------|
| shapes          | Statistical shape analysis                                                  | [https://CRAN.R-project.org/package=shapes](https://CRAN.R-project.org/package=shapes) | (Dryden and Mardia, 2016)                     |
| sclero          | Measure Growth Patterns and Align Sampling Spots in Photographs             | [https://CRAN.R-project.org/package=sclero](https://CRAN.R-project.org/package=sclero) |                                               |
| smwrGraphs      | Graphical USGS water science R functions                                    | [https://github.com/USGS-R/smwrGraphs](https://github.com/USGS-R/smwrGraphs) | (Lorenz and Diekoff, 2017)                    |
| soilphysics     | Soil Physical Analysis                                                      | [https://CRAN.R-project.org/package=soilphysics](https://CRAN.R-project.org/package=soilphysics) | (da Silva and de Lima, 2015)                  |
| soilprofile     | A package to consistently represent soil properties along a soil profile    | [https://CRAN.R-project.org/package=soilprofile](https://CRAN.R-project.org/package=soilprofile) |                                               |
| spMC            | Continuous-Lag Spatial Markov Chains                                        | [http://CRAN.R-project.org/package=spMC](http://CRAN.R-project.org/package=spMC) | (Sartore et al., 2016)                       |
| strap           | Stratigraphic Tree Analysis for Palaeontology                              | [http://CRAN.R-project.org/package=strap](http://CRAN.R-project.org/package=strap) | (Bell and Lloyd, 2015)                       |
| stratigraph     | Toolkit for the plotting and analysis of stratigraphic and palaeontological data | [http://CRAN.R-project.org/package=stratigraph](http://CRAN.R-project.org/package=stratigraph) |                                               |
| TERMITE         | Fast reduction of LA-ICPMS data and its application to trace element measurements | [https://github.com/SimonMischel/TERMITE/](https://github.com/SimonMischel/TERMITE/) | (Mischel et al., 2017)                       |
| tgcd            | Thermoluminescence Glow Curve Deconvolution                                | [http://CRAN.R-project.org/package=tgcd](http://CRAN.R-project.org/package=tgcd) | (Peng et al., 2016)                          |
| TLdating        | Tools for Thermoluminescences Dating                                        | [https://CRAN.R-project.org/package=TLdating](https://CRAN.R-project.org/package=TLdating) | (Strebler et al., 2017)                      |
| treeclim        | Numerical Calibration of Proxy-Climate Relationships                        | [http://CRAN.R-project.org/package=treeclim](http://CRAN.R-project.org/package=treeclim) | (Zang and Biondi, 2015)                      |
| XLConnect       | Excel Connector for R                                                       | [http://CRAN.R-project.org/package=XLConnect](http://CRAN.R-project.org/package=XLConnect) |                                               |
| zCompositions   | Treatment of Zeros and Nondetects in Compositional Data Sets                | [https://CRAN.R-project.org/package=zCompositions](https://CRAN.R-project.org/package=zCompositions) | (Palarea-Albaladejo and Martín-Fernández, 2015) |

CRAN Task View: Analysis of Spatial Data: [https://CRAN.R-project.org/view=Spatial](https://CRAN.R-project.org/view=Spatial)

CRAN Task View: Graphic Displays & Dynamic Graphics & Graphic Devices & Visualization: [https://CRAN.R-project.org/web/views/Graphics.html](https://CRAN.R-project.org/web/views/Graphics.html)

CRAN Task View: Handling and Analyzing Spatio-Temporal Data: [https://CRAN.R-project.org/view=SpatioTemporal](https://CRAN.R-project.org/view=SpatioTemporal)
## Selection of Free and Open Source Software for particular geoscientific tasks (also some freeware included; standalone desktop applications and script codes)

| Software          | Website                                      | Authors/Year                  |
|-------------------|----------------------------------------------|-------------------------------|
| ArAR              | [http://group18software.asu.edu/](http://group18software.asu.edu/) | (Mercer and Hodges, 2016)    |
| Atomsk            | [http://cpc.cs.qub.ac.uk/summaries/AEXM_v1_0.html](http://cpc.cs.qub.ac.uk/summaries/AEXM_v1_0.html) | (Hirel, 2015)                |
| AvoPlot           | [http://code.google.com/p/avoplot/](http://code.google.com/p/avoplot/) | (Peters, 2014)               |
| CaveCalc          | [https://github.com/Rob-Owen/cavelcalc](https://github.com/Rob-Owen/cavelcalc) | (Owen et al., 2018)          |
| CoDaPack          | [http://www.compositionaldata.com/](http://www.compositionaldata.com/) | (Comas-Cufí and Thio-Henestrosa, 2011) |
| CSciBox           | [https://github.com/lizbradley/cscibox](https://github.com/lizbradley/cscibox) |                            |
| DensityPlotter    | [http://www.ucl.ac.uk/~ucfbpve/densityplotter/](http://www.ucl.ac.uk/~ucfbpve/densityplotter/) | (Vermeesch, 2012)           |
| detritalPy        | [https://github.com/gesharman/detritalPy](https://github.com/gesharman/detritalPy) | (Sharman et al., 2018)       |
| DisChart          | [http://80.251.40.59/eng.ankara.edu.tr/akiska/dischart/](http://80.251.40.59/eng.ankara.edu.tr/akiska/dischart/) | (Aktska, 2015)              |
| ET Redux          | [http://cirdles.org/projects/et_redux/](http://cirdles.org/projects/et_redux/) | (McLean et al., 2016)        |
| EverVIEW          | [https://www.jem.gov/Modeling/EverView](https://www.jem.gov/Modeling/EverView) | (Romañach et al., 2015)      |
| GCEx              | [https://www.gfz-potsdam.de/en/section/geoinformatics/projects/gcex/](https://www.gfz-potsdam.de/en/section/geoinformatics/projects/gcex/) | (De Lucia et al., 2015)      |
| GeoStats.jl       | [https://github.com/juliohm/GeoStats.jl](https://github.com/juliohm/GeoStats.jl) | (Hoffmann, 2018)             |
| HelioPlot         | [http://www.ucl.ac.uk/~ucfbpve/helioplot/](http://www.ucl.ac.uk/~ucfbpve/helioplot/) | (Vermeesch, 2010)           |
| Hf-INATOR         | [http://link.springer.com/article/10.1007/s12145-017-0303-9](http://link.springer.com/article/10.1007/s12145-017-0303-9) | (Giovanardi and Lugli, 2017) |
| IgRoCS            | [http://taloj.iier.unam.mx/igrocs](http://taloj.iier.unam.mx/igrocs) | (Verma and Rivera-Gómez, 2013) |
| IsoFishR          | [https://github.com/MalteWillmes/IsoFishR](https://github.com/MalteWillmes/IsoFishR) | (Willmes et al., 2018)       |
| MorphoJ           | [http://www.flywings.org.uk/MorphoJ_page.htm](http://www.flywings.org.uk/MorphoJ_page.htm) | (Klingenberg, 2011)          |
| OpenChrom         | [https://www.openchrom.net/](https://www.openchrom.net/) | (Wenig and Odermatt, 2010)   |
| OpenGeoSys        | [http://www.opengeosys.org/home](http://www.opengeosys.org/home) | (Kolditz et al., 2012)       |
| OpenMS            | [http://www.openms.de/](http://www.openms.de/) | (Röst et al., 2016)          |
| OutlierFlag       | [https://bitbucket.org/yaqiang/outlierflag](https://bitbucket.org/yaqiang/outlierflag) | (Huang et al., 2016)         |
| PAST              | [http://folk.uio.no/ohammer/past/](http://folk.uio.no/ohammer/past/) | (Hammer et al., 2001)        |
| Petrograph        | [http://accounts.unipg.it/~maurip/SOFTWARE.htm](http://accounts.unipg.it/~maurip/SOFTWARE.htm) | (Petrelli et al., 2005)      |
| PHREEQC           | [https://wwwbrr.cr.usgs.gov/projects/GWC_coupled/phreeqc/](https://wwwbrr.cr.usgs.gov/projects/GWC_coupled/phreeqc/) | (Parkhurst and Appelo, 2013) |
| PmagPy            | [https://github.com/PmagPy/PmagPy](https://github.com/PmagPy/PmagPy) | (Tauxe et al., 2016)         |
| PuffinPlot        | [http://puffinplot.bitbucket.org/](http://puffinplot.bitbucket.org/) | (Lurcock and Wilson, 2012)   |
| pyBadlands        | [https://github.com/badlands-model](https://github.com/badlands-model) | (Salles et al., 2018)        |
| pycalphad         | [https://pycalphad.org/](https://pycalphad.org/) | (Otis and Liu, 2017)         |
| PyXRD             | [https://github.com/mathijs-dumon/PyXRD](https://github.com/mathijs-dumon/PyXRD) | (Dumon & Van Ranst, 2016)    |
| RadialPlotter     | [http://pvermees.andropov.org/radialplotter/](http://pvermees.andropov.org/radialplotter/) | (Vermeesch, 2009)           |
| Rcrust            | [http://www.sun.ac.za/english/faculty/science/earthsciences/rcrust](http://www.sun.ac.za/english/faculty/science/earthsciences/rcrust) | (Mayne et al., 2016)         |
| RGeostats         | [http://cg.ensmp.fr/rgeostats](http://cg.ensmp.fr/rgeostats) |                            |
SGeMS  http://sgems.sourceforge.net/ (Remy et al., 2009)
SINCLAS  https://iamg.org/documents/oldftp/VOL28/v28-05-12.zip (Verma et al., 2002)
SpectraFox  http://www.spectrafox.com/ (Ruby, 2016)
Spekwin32  http://www.effemm2.de/spekwin
StronTer  freely available from the authors (Hercman and Pawlak, 2016)
TecDIA  http://tlaloc.ier.unam.mx/tecdia (Verma et al., 2015)
Theriak/Domino  http://titan.minpet.unibas.ch/minpet/theriak/theruser.html (de Capitani and Petrakakis, 2010)
THERIAK_D add-on  http://www.min.uni-kiel.de/~ed/theriakd/ (Dueusterhoeft and de Capitani, 2013)
t-Igpet  https://sites.google.com/site/tsigpetteaching/ (Carr and Gazel, 2016)
TriAngle  http://geo-consulting.warnsloh.com/triangle/ (Warnsloh, 2015)
uFREASI  http://www.ipgp.fr/~tharaud/uFREASI (Tharaud et al., 2015)
UPbplot.py  https://github.com/anoda/UPbplot.py (Noda, 2017)

**Stereographic projections, structural geological data**

APSG  https://github.com/ondrolexa/apsg
GarcmB  http://www.kueps.kyoto-u.ac.jp/~web-bs/tsg/software/GArcmB/ (Yamaji, 2016)
hypercontour_m  https://github.com/cageo/Vollmer-2018 (Vollmer, 2018)
InnStereo  http://innstereo.github.io/
MARD  http://dx.doi.org/10.1016/j.cageo.2012.07.012 (Munro and Blenkinsop, 2012)
mplstereonet  https://github.com/joferkington/mplstereonet
Open Plot Pj.  http://www.openplot.altervista.org/ (Tavani et al., 2011)
OpenStereo  http://www.isc.usp.br/index.php?id=openstereo (Grohmann and Campanha, 2012)
Orient  http://www.frederickvollmer.com/orient/
OrientXplot  http://www.rossangel.com/text_orientxplot.htm (Angel et al., 2015)
SG2PS  http://www.sg2ps.eu/ (Sasvári and Baharev, 2014)
Slicken  http://www.geociencias.unam.mx/~afns/Slicken_1.0.jar (Xu et al., 2017)
Stereonet3D  http://www.ux.uis.no/~nestor/work/programs.html (Cardozo and Allmendinger, 2013)
y-gRaph  https://dl.dropboxusercontent.com/u/41688281/yR_toPaper/yRdiagram.zip (Calvin et al. 2014)

**Image processing, data visualisation**

AERYN  http://www.tcd.ie/Geology/staff/crowleyq/AERYN/ (Mouchi et al., 2016)
AutoMorph  https://github.com/HullLab/AutoMorph (Hsiang et al., 2018)
Avogadro  http://avogadro.cc/ (Hanwell et al., 2012)
Binary Traverser  http://www.geo.umass.edu/climate/lewis/analysis/ (Lewis et al., 2010)
BiolImageXD  http://www.bioimagexd.net/ (Kankaanpää et al., 2008, 2012)
BoneJ  http://bonej.org/ (Doube et al., 2010)
DiameterJ  https://imagej.net/DiameterJ (Hotaling et al., 2015)
EBSD-Image  http://www.ebsd-image.org/ (Pinard et al., 2011)
Endrov  http://www.endrov.net/ (Henriksson et al., 2013)
FAME  http://peternell.org/archive.html (Hammes and Peternell, 2016)
| Fiji + ICY               | [https://imagej.net/Fiji](https://imagej.net/Fiji) (Schindelin et al., 2012), [http://icy.bioimageanalysis.org/](http://icy.bioimageanalysis.org/) (de Chaumont et al., 2011) (see in: Miguez-Salas et al., 2019) |
|-------------------------|-------------------------------------------------------------------------------------------------------------|
| GPlates                 | [http://www.gplates.org](http://www.gplates.org) (Boyd et al., 2011, Müller et al., 2018b)                  |
| Gwyddion                | [http://gwyddion.net/](http://gwyddion.net/) (Nečas and Klapetek, 2011)                                    |
| ImageSURF               | [http://sites.imagej.net/ImageSURF/](http://sites.imagej.net/ImageSURF/) (O’Mara et al., 2017)             |
| Jansen-MIDAS            | [https://github.com/alexandrejaguar/publications/tree/master/2017/jansen_midas](https://github.com/alexandrejaguar/publications/tree/master/2017/jansen_midas) (de Siqueira et al., 2018) |
| JM MicroVision          | [http://www.jmicrovision.com](http://www.jmicrovision.com) (Roduit, 2015)                                   |
| JMorph                  | [https://github.com/cageo/Lelievre-2017](https://github.com/cageo/Lelievre-2017) (Lelièvre and Grey, 2017) |
| Jpor (ImageJ plug-in)   | [http://www.geoanalysis.org/jPOR.html](http://www.geoanalysis.org/jPOR.html) (Grove and Jerram, 2011)     |
| LA-ICP-MS Image Tool    | [https://www.reid-it.co.uk/downloads/down_la_icp_ms_it.htm](https://www.reid-it.co.uk/downloads/down_la_icp_ms_it.htm) (Managh and Reid, 2019) |
| LA-iMageS               | [http://www.la-images.net/](http://www.la-images.net/) (López-Fernández et al., 2016)                     |
| Micro-Manager           | [https://micro-manager.org/](https://micro-manager.org/) (Edelstein et al., 2010, 2014)                    |
| MIST                    | [http://ischuller.ucsd.edu/MIST/](http://ischuller.ucsd.edu/MIST/) (Valmianski et al., 2014)               |
| MorphoTester            | [https://github.com/juliawinchester/morphotester](https://github.com/juliawinchester/morphotester) (Winchester, 2016) |
| OpenCFU                 | [http://openctu.sourceforge.net/](http://openctu.sourceforge.net/) (Geissmann, 2013)                      |
| ParaViewGeo             | [http://paraviewgeo.objectivity.ca/](http://paraviewgeo.objectivity.ca/)                                |
| PhaseQuant              | [http://www.cosmoprograms.com/](http://www.cosmoprograms.com/) (Elangovan et al., 2012)                  |
| rasdaman                | [http://www.rasdaman.org/](http://www.rasdaman.org/)                                                      |
| surfit                  | [http://surfit.sourceforge.net/](http://surfit.sourceforge.net/)                                        |
| ScatterJn               | [http://dx.doi.org/10.5281/zenodo.22167](http://dx.doi.org/10.5281/zenodo.22167) (Zeitvogel and Obst, 2016) |
| scikit-image            | [http://scikit-image.org/](http://scikit-image.org/) (van der Walt et al., 2014)                         |
| Takin                   | [https://github.com/ElsevierSoftwareX/SOFTX-D-16-00031](https://github.com/ElsevierSoftwareX/SOFTX-D-16-00031) (Weber et al., 2016) |
| Vespucci                | [https://github.com/dpfoose/Vespucci](https://github.com/dpfoose/Vespucci) (Foose and Sizemore, 2016)      |
| VESTA                   | [http://jp-minerals.org/VESTA/en/](http://jp-minerals.org/VESTA/en/) (Momma and Izumi, 2011)             |
| Visualization Toolkit (VTK) | [https://www.vtk.org](https://www.vtk.org) (Hanwell et al., 2015)                                       |
| XCrySDen                | [http://www.xcrysden.org/](http://www.xcrysden.org/) (Kokalj, 2003)                                      |
| xyscan                  | [http://rhig.physics.yale.edu/~ullrich/software/xyscan/](http://rhig.physics.yale.edu/~ullrich/software/xyscan/) |
| YaDiV                   | [http://www.welfenlab.de/en/yadiv](http://www.welfenlab.de/en/yadiv) (Friese et al., 2013)                |

**Stratigraphic plots**

| CoreWall               | [http://www.corewall.org/](http://www.corewall.org/) (e.g., Conze et al., 2010)                          |
| MatStrat               | [http://matstrat.princeton.edu/](http://matstrat.princeton.edu/) (Lewis et al., 2011)                 |
| Polito                 | [http://sourceforge.net/projects/polito](http://sourceforge.net/projects/polito) (Stremtan and Tudor, 2010) |
| PSICAT                 | [http://portal.chronos.org/psicat-site/](http://portal.chronos.org/psicat-site/) (Reed et al., 2006)   |
| SedLog                 | [http://www.sedlog.com/](http://www.sedlog.com/) (Zervas et al., 2009)                                |
| StratFit               | [https://www.annalsofgeophysics.eu/index.php/annals/article/view/7619](https://www.annalsofgeophysics.eu/index.php/annals/article/view/7619) (Sagnotti and Caricchi, 2018) |
| TimeScale Creator      | [https://engineering.purdue.edu/Stratigraphy/tscreator/index/index.php](https://engineering.purdue.edu/Stratigraphy/tscreator/index/index.php) |

**Spatial data / Remote sensing**

| DigiFract              | [https://sites.google.com/site/digifract/](https://sites.google.com/site/digifract/) (Hardebol and Bertotti, 2013) |
| Category                  | Tools                                                                 |
|--------------------------|-----------------------------------------------------------------------|
| **Geophysical/Seismic data** | GMT [GMT](http://gmt.soest.hawaii.edu/) (Wessel et al., 2019)          |
|                          | Geoblock [Geoblock](http://geoblock.sourceforge.net/)                  |
|                          | GeoCube [GeoCube](http://www.mediafire.com/file/7dn243zkv7d3oy6/GeoCube.rar) (Li et al., 2016) |
|                          | GeoDA [GeoDA](http://geodacenter.github.io/) (Anselin et al., 2006)   |
|                          | GeoPAT [GeoPAT](http://sil.uc.edu/) (Jasiewicz et al., 2015)          |
|                          | Nansat [Nansat](https://github.com/nansencenter/nansat) (Korosov et al., 2016) |
|                          | Processing [Processing](https://github.com/anitagraser/QGIS-Processing-tools) (Graser and Olaya, 2015) |
|                          | PySESA [PySESA](http://dbuscombe-usgs.github.io/pysesa/) (Buscombe, 2016) |
|                          | PyTrx [PyTrx](https://github.com/PennyHow/PyTrx) (How et al., 2020)   |
|                          | Whitebox GAT [Whitebox GAT](http://www.uoguelph.ca/~hydrogeo/Whitebox/) (Lindsay, 2016) |
|                          | **Geophysics/Seismic data**                                           |
|                          | APASVO [APASVO](https://github.com/jemromerol/apasvo) (Romero et al., 2016) |
|                          | Gsolve [Gsolve](https://github.com/ElsevierSoftwareX/SOFTX-D-16-00075) (McCubbine et al., 2018) |
|                          | JUDI [JUDI](https://github.com/slimgroup/JUDI.jl) (Witte et al., 2019) |
|                          | LTide [LTide](https://doi.org/10.1007/s12145-019-00379-y) (Electronic supplementary material) (Bjelotomić Oršulić et al., 2019) |
|                          | Madagascar [Madagascar](http://www.abay.org/) (Fomel et al., 2013)   |
|                          | ObsPy [ObsPy](http://www.obspy.org/) (Beyreuther et al., 2010)       |
|                          | OpendTect [OpendTect](http://www.opendtect.org/)                      |
|                          | pyGrav [pyGrav](http://basileh.github.io/pyGrav/) ( Hector and Hinderer, 2016) |
|                          | pynodddy [pynodddy](https://github.com/flohorovicic/pynodddy) (Wellmann et al., 2016) |
|                          | Pytheas [Pytheas](https://github.com/ispingos/pytheas-splitting) (Spingos et al., 2020) |
|                          | ResiPy [ResiPy](https://gitlab.com/hkex/pyr2) (Blanchy et al., 2020) |
|                          | Seismic Toolkit [Seismic Toolkit](http://seismic-toolkit.sourceforge.net/) |
|                          | SHTOols [SHTOols](https://github.com/SHTOOLS/SHTOOLS) (Wieczorek and Meschede, 2018) |
|                          | SimPEG [SimPEG](http://simpeg.xyz/) (Cockett et al., 2015)           |
|                          | **Uncategorized**                                                    |
|                          | ADFNE [ADFNE](http://alghalandis.net/products/adfne) (Fadakar, 2017) |
|                          | AMORPH [AMORPH](https://bitbucket.org/eggplantbren/amorph) (Rowe and Brewer, 2018) |
|                          | CIPWFULL [CIPWFULL](http://www.ims.demokritos.gr/download/DRcalculator.exe) (Tsakalos et al., 2016) |
|                          | Dose rate calculator (DRc) [Dose rate calculator (DRc)](http://www.ims.demokritos.gr/download/DRcalculator.exe) (Tsakalos et al., 2016) |
|                          | GemPy [GemPy](https://github.com/cgre-aachen/gempy) (de la Varga et al., 2019) |
|                          | GeoPyTool [GeoPyTool](https://github.com/GeoPyTool/GeoPyTool) (Yu et al., 2019) |
|                          | GrainsizeAnalysis [GrainsizeAnalysis](https://doi.org/10.1007/s12145-019-00440-w) (Electronic supplementary material) (Xu et al., 2020) |
|                          | GrainSizeTools [GrainSizeTools](http://marcoalopez.github.io/GrainSizeTools/) (Lopez-Sanchez and Llana-Fúnez, 2015) |
|                          | MetClass [MetClass](http://www.paleotax.de/) (Löser, 2004)           |
|                          | OXDPMM [OXDPMM](http://www.ims.demokritos.gr/download/DRcalculator.exe) (Tsakalos et al., 2016) |
|                          | PaleoTax [PaleoTax](http://www.paleotax.de/) (Löser, 2004)           |
| Tool | URL | Notes |
|------|-----|-------|
| PyBacktrack | https://github.com/EarthByte/pyBacktrack | (Müller et al., 2018a) |
| PyFLOWGO | https://github.com/pyflowgo/pyflowgo | (Chevrel et al., 2018) |
| PyMca XRF Toolkit | http://pymca.sourceforge.net/ | (Solé et al., 2007) |
| RDSS | http://rdss.sourceforge.net/ | (Apopei et al., 2015) |
| SedInConnect | https://github.com/HydrogeomorphologyTools/SedInConnect_2.3 | (Crema and Cavalli, 2018) |
| Survex | http://survex.com/ | |
| TerraFERMA | http://terraferma.github.io/ | (Wilson et al., 2017) |
| THERIA_G | https://doi.org/10.1007/s00410-007-0263-z | (Electronic supplementary material) (Gaidies et al., 2008) |
| Therion | https://therion.speleo.sk/ | |
| Virtual Petrographic Microscope | http://eps.mq.edu.au/vpm/ | (Tetley and Daczko, 2014) |

**Selection of FLOSS or scripts depending on proprietary software (e.g., Excel, Matlab, …)**

| Tool | URL | Notes |
|------|-----|-------|
| Acycle | https://github.com/mingsongli/acycle | (Li et al., 2019) |
| ANIE | | Supporting information of article (Huber et al., 2011) |
| BasinVis | http://geologist-lee.com/basinvis.html | (Lee et al., 2016) |
| CALCMIN | https://www.iang.org/documents/oldftp/VOL35/v35-07-19.zip | (Brandelik, 2009) |
| CEmin | http://www.earthobservatory.sg/resources/software/cemin-tool-extraction-plagioclase-crystals-electron-images | (Zeng et al., 2018) |
| CGDK | https://doi.org/10.1594/PANGAEA.786481 | (Qiu et al., 2013) |
| Converting scanned images of seismic reflection data into SEG-Y format | Matlab script available from author (Sopher, 2017) | |
| CosmoCalc | http://www.ucl.ac.uk/~ucfbpve/cosmocalc/ | (Vermeesch, 2007) |
| Demagnetization Analysis in Excel (DAIE) | http://roma2.rm.ingv.it/en/facilities/software/49/daie | (Sagnotti, 2013) |
| EBSDinterp | http://dx.doi.org/10.4225/08/5510090C6E620 | (Pearce, 2015) |
| EWave | https://github.com/xinzhong0708/EWave | (Zhong and Frehner, 2018) |
| GCDPlot | https://sourceforge.net/projects/gcdplot/ | (Wang et al., 2008) |
| geomIO | https://geomio.bitbucket.io/ | (Bauville and Baumann, 2019) |
| FastGAPP | http://www.digital-geography.com/fastgapp-fast-geochemical-analysis-plotting-program/ | |
| GAME | https://www.mathworks.com/matlabcentral/fileexchange/67398-game | (Cannavò, 2019) |
| GCH_gravinv | https://github.com/cageo/Oksum_2018 | (Pham et al., 2018) |
| GeoPlot | http://www.geology.com.cn/geoplot/ | (Zhou and Li, 2006) |
| GeoStrain | https://geostrain.sourceforge.io | (Goudarzi, 2015) |
| Geological Image Analysis Software (GIAS) | http://www.geoanalysis.org/ | (Beggan and Hamilton, 2010) |
| GMT/MATLAB Toolbox | http://gmt.soest.hawaii.edu/projects/gmt-matlab-octave-api/wiki | (Wessel and Luis, 2017) |
| IG-Mapper | | Supplement of article (Fiannacca et al., 2017) |
| **Tool** | **Website** | **Description** |
|---------|-------------|-----------------|
| iSpectra | [http://www.igorexchange.com/project/iSpectra](http://www.igorexchange.com/project/iSpectra) (Liebske, 2015) |  |
| Knickpoint Finder | [https://github.com/cageo/Queiroz-2014](https://github.com/cageo/Queiroz-2014) (Queiroz et al., 2015) |  |
| LCC tool (Large Crater Clustering tool) | [https://github.com/USGS-Astrogeology/LargeCraterClusteringTool](https://github.com/USGS-Astrogeology/LargeCraterClusteringTool) (Laura et al., 2017) |  |
| MagB_inv | [https://github.com/PhamLT/MagB](https://github.com/PhamLT/MagB) (Pham et al., 2020) |  |
| MapIT! | [http://www.rsc.org/suppdata/c7/ia/c7ia00023e/c7ia00023e2.zip](http://www.rsc.org/suppdata/c7/ia/c7ia00023e/c7ia00023e2.zip) (Sfornea and Lugli, 2017) |  |
| MATNORM | [https://www.iagm.org/documents/oldftp/VOL35/v35-09-04.zip](https://www.iagm.org/documents/oldftp/VOL35/v35-09-04.zip) (Pruseth, 2009) |  |
| MeltMigrator | [https://github.com/montesi/MeltMigrator](https://github.com/montesi/MeltMigrator) (Bai et al., 2016) |  |
| MELTS_Excel | [http://melts.ofm-research.org/](http://melts.ofm-research.org/) (Gualda and Ghiorso, 2014) |  |
| MINSORTING | [https://github.com/cageo/Resentini-2013](https://github.com/cageo/Resentini-2013) (Resentini et al., 2013) |  |
| MTEX | [http://mtex-toolbox.github.io/](http://mtex-toolbox.github.io/) (Bachmann et al., 2010) |  |
| OATools | [https://is.muni.cz/www/175417/prvnistrana.html](https://is.muni.cz/www/175417/prvnistrana.html) (Kociánová and Melichar, 2016) |  |
| PetroPlot | [http://www.earthchem.org/petdbWeb/search/PetroPlot/index.html](http://www.earthchem.org/petdbWeb/search/PetroPlot/index.html) (Su et al., 2003) |  |
| PHAPS | [http://geomodeling.uni-koeln.de/Geo-Cosmochemical_Modeling/PHAPS.html](http://geomodeling.uni-koeln.de/Geo-Cosmochemical_Modeling/PHAPS.html) (Hezel, 2010) |  |
| Rotating 3d Globe | [http://www.asu.cas.cz/~bezdek/vyzkum/rotating_3d_globe/](http://www.asu.cas.cz/~bezdek/vyzkum/rotating_3d_globe/) (Bezděk and Sebéra, 2013) |  |
| SEDMIN | [http://earthscienceeducation.net/SEDMIN/SedimentaryMineralCalculator.xlsx](http://earthscienceeducation.net/SEDMIN/SedimentaryMineralCalculator.xlsx) (Kackstaetter, 2014) |  |
| SrDR | [https://doi.org/10.1039/C9JA00424F](https://doi.org/10.1039/C9JA00424F) (Supplementary files) (Lugli et al., 2020) |  |
| SSLIPO | [http://www.geociencias.unam.mx/~alaniz/main_code.txt](http://www.geociencias.unam.mx/~alaniz/main_code.txt) (Alvarez del Castillo et al., 2017) |  |
| StrainModeler | [https://github.com/cageo/Bobillo-Ares-2015](https://github.com/cageo/Bobillo-Ares-2015) (Bobillo-Ares et al., 2015) |  |
| StratDraw | [https://www.iagm.org/documents/oldftp/VOL30/v30-07-10.zip](https://www.iagm.org/documents/oldftp/VOL30/v30-07-10.zip) (Hoelzel, 2004) |  |
| TerraceM-2 | [https://doi.org/10.3389/feart.2019.00255](https://doi.org/10.3389/feart.2019.00255) (Supplementary Material) (Jara-Muñoz et al., 2019) |  |
| TETGAR_C | [http://dx.doi.org/10.3190/igeosci.284](http://dx.doi.org/10.3190/igeosci.284) (Supplementary Material) (Knierzinger et al., 2019) |  |
| Tetrahedral plot diagram | [http://www.minsocam.org/MSA/AmMin/TOC/2015/ND2015_data/AM-15-115371.zip](http://www.minsocam.org/MSA/AmMin/TOC/2015/ND2015_data/AM-15-115371.zip) (Shimura and Kemp, 2015) |  |
| TomoFab | [https://github.com/benpetri/tomofab](https://github.com/benpetri/tomofab) (Petri et al., 2020) |  |
| TReacLab | [https://github.com/TReacLab/TReacLab](https://github.com/TReacLab/TReacLab) (Jara et al., 2017) |  |
| TURBO2 | [https://github.com/cageo/Trauth-2013](https://github.com/cageo/Trauth-2013) (Trauth, 2013) |  |
| XMapTools | [http://www.xmaptools.com/](http://www.xmaptools.com/) (Lanari et al., 2014) |  |
| An Excel-based tool for evaluating and visualizing geothermobarometry data | [https://github.com/cageo/Hora-2013](https://github.com/cageo/Hora-2013) (Hora et al., 2013) |  |
| Sandstone Provenance and Classification Ternary Diagrams | [http://www.sepm.org/CM_Files/81_9_zahid_da_corrected.xls](http://www.sepm.org/CM_Files/81_9_zahid_da_corrected.xls) (Zahid and Barbeau, 2011) |  |
Useful weblinks to alternative software

General (Free Software alternative collections, manuals)

- Awesomecow  (http://awesomecow.com/)
- FLOSSmanuals  (http://en.flossmanuals.net/)
- FossHub  (https://www.fosshub.com/)
- Free Open Source Software  (https://freeopensourcesoftware.org)
- Free Software Directory  (https://directory.fsf.org)
- Freiheit für Computer  (http://www.openos.at/)
- Linux Alternative Project  (http://www.linuxalt.com/)
- Linux Equivalents to Windows Software  (http://www.linuxlinks.com/article/20070701111340544/Equivalents.html)
- List of free and open-source software packages  (https://en.wikipedia.org/wiki/List_of_free_and_open-source_software_packages)
- List of free statistical software  (http://statistiksoftware.com/free_software.html)
- Open Source Alternative  (http://www.opensourcealternative.org/)
- Opensource-DVD  (http://www.opensource-dvd.de)
- Open Source Software & Freeware  (https://informatik.univie.ac.at/studium/hilfe-fuer-studierende/software/opensource/)
- Open Source Software Directory  (https://opensourcesoftwaredirectory.com/)
- Open Source Software List: The Ultimate List  (http://www.datamation.com/open-source/open-source-software-list-ultimate-list-1.html)
- osalt - open source as alternative  (http://www.osalt.com/)
- OSS Watch  (http://oss-watch.ac.uk/)
- Savannah  (https://savannah.gnu.org/)
- Software für das Studium  (https://www.e-fellows.net/wiki/index.php/Software_f%cc%88r_das_Studium)
- SourceForge  (http://sourceforge.net)
- UbuntuScience  (https://help.ubuntu.com/community/UbuntuScience/AlternativesToProprietarySoftware)
- Wiki - Bildung und Wissenschaft  (https://wiki.ubuntuusers.de/Bildung_und_Wissenschaft/)
- Wikipedia Portal: Free and open-source software  (https://en.wikipedia.org/wiki/Portal:Free_and_open-source_software)

Software Compilations and Informations for Geoscientists

- awesome-open-geoscience  (https://github.com/softwareunderground/awesome-open-geoscience)
- All the software a geoscientist needs. For free!  (http://all.geo.org/volcan01010/2011/11/all-the-software-a-geoscientists-needs-for-free/)
- Computers & Geosciences (Links to Program Code)  (https://github.com/CAGEO)
- EarthChem - Tools for Scientists  (http://www.earthchem.org/resources/tools)
- Freie Software  (https://www.teuderun.de/freie-software/)
- Geochemical Plotting Programs  (http://serc.carleton.edu/NAGTWorkshops/petrology/plot_programs.html)
- Geoforge  (http://www.geoforge.org/)
- Geotechnical Engineering Software Database  (http://www.geoengineer.org/software/home)
- Geotechnical Freeware  (http://www.yongtechnology.com/)
- List of free geology software  (http://en.wikipedia.org/wiki/List_of_free_geology_software)
- OntoSoft  (http://www.ontosoft.org)
- OpenScience  (http://www.openscience.org)
- Open Source and Free Software and Resources for Geoscientists  (https://babelflysch.wordpress.com/software/)
- Open source software for Structural Geology analyses and research  (https://www.linkedin.com/pulse/open-source-software-structural-geology-analysis-debanjan-guha-roy)
- Open Source Software related to Geoscience and Remote Sensing  (http://www.grss-ieee.org/open-source-software-related-to-geoscience-and-remote-sensing)
- Programme/Apps/Add-ons (Österreichische Geologische Gesellschaft)  (http://www.geologie.or.at/index.php/links/apps-ad-ins)
- USGS Github Repositories  (https://github.com/usgs)
Scientific/Educational Linux distributions

- ArcheOS  (http://www.archeos.eu/)
- BioLinux  (http://environmentalomics.org/bio-linux/)
- Fedora Scientific  (https://labs.stg.fedoraproject.org/scientific/)
- Manjaro for Scientists (https://manjaro.org/features/usercases/scientists/)
- OSGeo-Live  (http://live.osgeo.org/en/index.html)
- Zorin OS Educational  (http://zorin-os.com/)
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