Singular

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- a comprehensive online manual and help function.

Singular

SINGULAR

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Algorithmic and Experimental Methods

SINGULAR is a computer algebra system for polynomial computations, with special emphasis on commutative and non-commutative algebra, algebraic geometry, and singularity theory. It is free and open-source under the **GNU General Public Licence**.

SINGULAR provides

- highly efficient core algorithms,
- a multitude of advanced algorithms in the above fields,
- an intuitive, C-like programming language,
- easy ways to make it user-extendible through libraries, and
- a comprehensive **online manual** and help function.

Its main computational objects are ideals, modules and matrices over a large number of baserings. These include

- polynomial rings over various ground fields and some rings (including the integers),
- localizations of the above,
- a general class of non-commutative algebras (including the exterior algebra and the Weyl algebra),
- quotient rings of the above,
- tensor products of the above.

SINGULAR's core algorithms handle

- Gröbner resp. standard bases and free resolutions,
- polynomial factorization,
- resultants, characteristic sets, and numerical root finding.

Its advanced algorithms, contained in currently **more than 90 libraries**, address topics such as **absolute factorization**, **algebraic D-modules**, **classification of singularities**, **deformation theory**, **Gauss-Manin systems**, **Hamburger-Noether (Puiseux) development**, **invariant theory**, **(non-) commutative homological algebra**, **normalization**, **primary decomposition**, **resolution of singularities**, and **sheaf cohomology**.

Further functionality is obtained by combining SINGULAR with **third-party software linked to SINGULAR**. This includes tools for **convex geometry**, **tropical geometry**, and **visualization**.

SINGULAR is developed under the direction of **Wolfram Decker**, **Gert-Martin Greuel**, **Gerhard Pfister**, and **Hans Schönemann** who head SINGULAR's core development team within the **Department of Mathematics** of the **University of Kaiserslautern**.

SINGULAR Developers

Citation Record (data from https://zbmath.org)

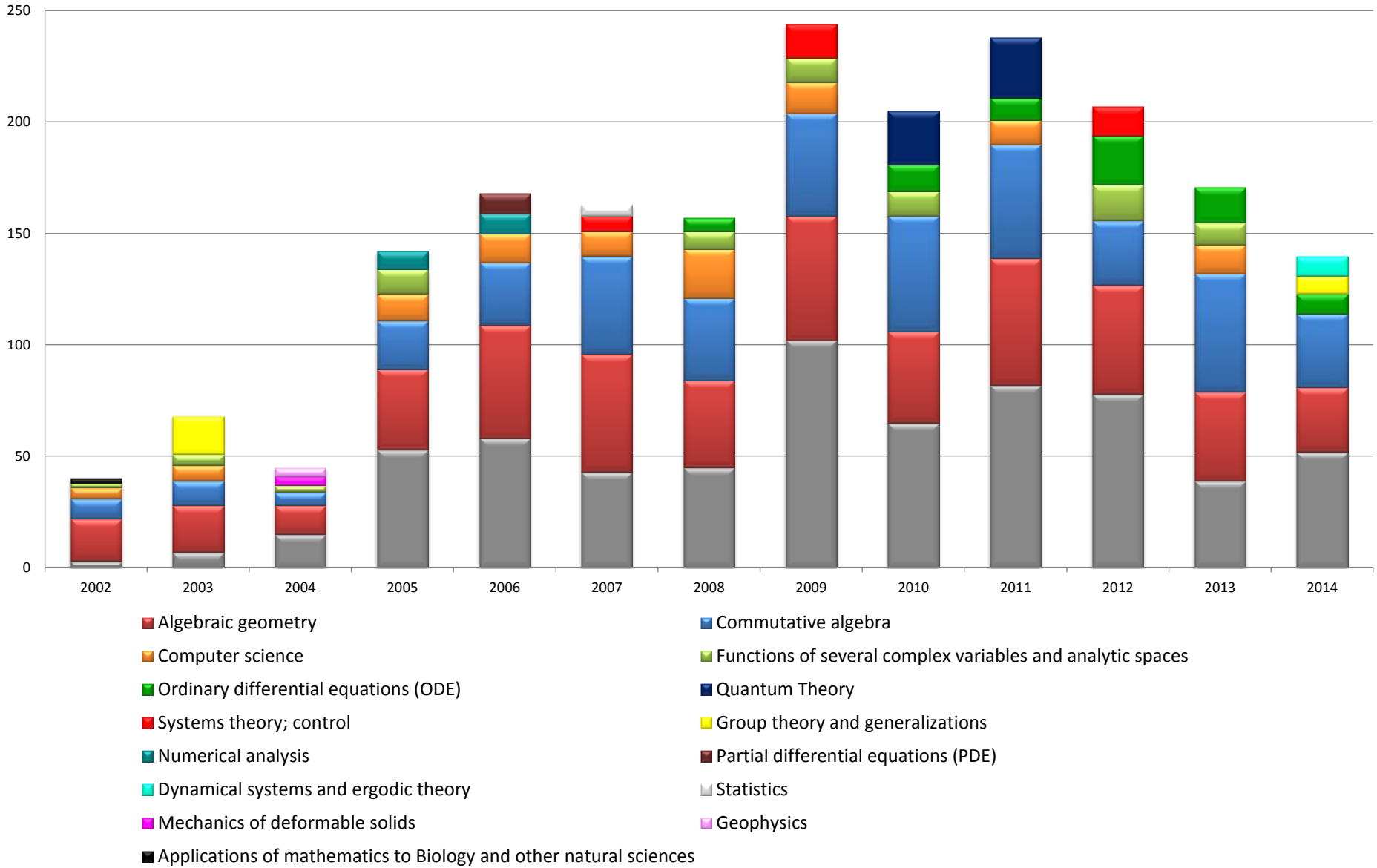

Figure: Top five MSC areas for SINGULAR per year, remaining areas in grey

Cooperation