

## CoCoALib - CoCoALib Open Issues

| #                           | Target version   | Status      | Subject  | Updated           | % Done | Priority | Assignee           |
|-----------------------------|------------------|-------------|--|-------------------|--------|----------|--------------------|
| <b>None (11)</b>            |                  |             |  |                   |        |          |                    |
| 1803                        | CoCoALib-0.99900 | New         | Improve trivial operations with ideal whose GBasis is [1]  | 25 Mar 2024 19:06 | 0      | Normal   | Anna Maria Bigatti |
| 1654                        |                  | New         | New function IsInSymbols                                   | 12 May 2023 08:03 | 0      | Normal   |                    |
| 1620                        |                  | New         | MinPolyQuot not documented                                 | 15 Oct 2021 14:24 | 0      | Normal   |                    |
| 921                         | CoCoALib-1.0     | New         | Design GBMill  | 22 May 2017 14:11 | 0      | Normal   |                    |
| 919                         | CoCoALib-1.0     | New         | Hilbert Driven GBasis                                      | 22 May 2017 14:11 | 0      | Normal   |                    |
| 282                         | CoCoALib-1.0     | New         | Global setting: to use IsProbPrime in place of IsPrime     | 01 Aug 2014 08:59 | 0      | Normal   |                    |
| 281                         | CoCoALib-1.0     | New         | Store unique copy of FF(p) in GlobalManager                | 04 Apr 2014 17:10 | 0      | Normal   |                    |
| 277                         | CoCoALib-1.0     | New         | Eliminate class RefPPMonoidElem?                           | 01 Aug 2014 08:59 | 0      | Normal   |                    |
| 258                         | CoCoALib-1.0     | New         | Multivariate lifting                                       | 01 Aug 2014 08:59 | 0      | Normal   |                    |
| 257                         | CoCoALib-1.0     | New         | Transcribe C4 code for GCD in QQ[x]                        | 01 Aug 2014 08:59 | 0      | Normal   |                    |
| 6                           | CoCoALib-1.0     | New         | Sort out RingElem, RefRingElem, ConstRefRingElem mess      | 01 Aug 2014 08:59 | 0      | High     | John Abbott        |
| <b>Data Structures (20)</b> |                  |             |  |                   |        |          |                    |
| 1784                        | CoCoALib-0.99900 | New         | Add flag IhaveHomogGensValue for ideals in SparsePolyRing? | 01 Mar 2024 14:36 | 0      | Normal   |                    |
| 1767                        | CoCoALib-0.99900 | In Progress | Finalize design for ideals in CoCoALib                     | 08 Mar 2024 17:26 | 10     | Normal   |                    |
| 1744                        | CoCoALib-0.99880 | In Progress | Implement GBMill (aka Groebner Framework)                  | 25 May 2023 14:30 | 10     | Normal   | Anna Maria Bigatti |
| 1738                        | CoCoALib-0.99880 | New         | Suggestion about Graded polynomial rings                   | 05 May 2023 08:47 | 10     | Normal   |                    |
| 1422                        | CoCoALib-0.99880 | In Progress | Remove flag IhaveGBasisValue?                              | 16 Feb 2024 17:56 | 10     | Normal   | Anna Maria Bigatti |
| 1414                        | CoCoALib-0.99880 | In Progress | Make class RingElemVector?                                 | 25 Apr 2024 21:53 | 20     | High     |                    |
| 1381                        | CoCoALib-0.99880 | In Progress | Type ideal for ZZ[x[1..n]]                                 | 16 Feb 2024 09:47 | 10     | Normal   |                    |
| 1168                        | CoCoALib-0.99900 | In Progress | ideal: does const ourGetPtr really need to be private?     | 08 Mar 2024 17:26 | 40     | Normal   |                    |
| 1115                        | CoCoALib-0.99900 | In Progress | New class: exterior algebra                                | 31 Jan 2024 21:59 | 20     | Normal   | John Abbott        |
| 924                         | CoCoALib-0.99880 | New         | FlagManager for bool/bool3 flags                           | 16 Feb 2024 17:57 | 50     | Normal   | Anna Maria Bigatti |
| 871                         | CoCoALib-0.99880 | New         | Redesign ideals  | 31 Oct 2023 11:24 | 0      | Normal   |                    |
| 832                         | CoCoALib-1.0     | New         | Generalize grading matrix                                  | 14 Mar 2024 11:29 | 20     | Low      |                    |
| 826                         | CoCoALib-1.0     | New         | Sparse matrices  | 02 Dec 2015 18:24 | 0      | Normal   |                    |
| 769                         | CoCoALib-1.0     | In Progress | CoCoALib cone  | 27 Jan 2020 15:32 | 10     | Normal   |                    |
| 729                         | CoCoALib-1.0     | In Progress | Betti numbers, betti diagram                               | 14 Jun 2018 15:54 | 10     | Normal   |                    |

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| 550                       | CoCoALib-1.0     | New         | add myResolution member field to ideal and (sub)module                                     | 13 May 2015 09:57 | 0      | Normal   |                    |
| 427                       | CoCoALib-1.0     | In Progress | Error names and error messages (current design)  | 11 May 2017 10:57 | 10     | Normal   |                    |
| 396                       | CoCoALib-1.0     | New         | PPMonoidElemAlias: redesign PPMonoidElem the same way as RingElem?                         | 13 May 2015 09:57 | 0      | Normal   | John Abbott        |
| 130                       | CoCoALib-1.0     | New         | Design problem in ideals   | 13 May 2015 09:56 | 0      | Normal   |                    |
| 126                       | CoCoALib-1.0     | New         | New datastructures directory   | 13 May 2015 09:56 | 0      | Normal   |                    |
| <b>Documentation (35)</b> |                  |             |  |                   |        |          |                    |
| 1812                      | CoCoALib-0.99880 | New         | Documentation: indexXX.html should be recompiled if version has changed                    | 29 Mar 2024 10:37 | 0      | Normal   |                    |
| 1809                      | CoCoALib-0.99880 | New         | Make ex-syz.C  | 28 Mar 2024 08:45 | 10     | Normal   | Anna Maria Bigatti |
| 1775                      |                  | New         | CoCoALib releases on redmine   | 03 May 2024 07:32 | 70     | Normal   | Anna Maria Bigatti |
| 1673                      | CoCoALib-0.99880 | New         | Review examples  | 08 Mar 2023 19:45 | 0      | Normal   |                    |
| 1672                      | CoCoALib-0.99900 | New         | Documentation: a good model to follow?   | 16 Feb 2024 09:33 | 0      | Normal   |                    |
| 1665                      | CoCoALib-0.99880 | New         | Compilation on Windows: problems for normaliz  | 18 Mar 2024 09:27 | 0      | Normal   | Anna Maria Bigatti |
| 1664                      | CoCoALib-0.99880 | New         | geobucket: documentation   | 08 Mar 2023 19:44 | 0      | Normal   |                    |
| 1662                      | CoCoALib-0.99880 | Resolved    | txt2tags: problem with filenames containing "_" or "-"                                     | 09 Apr 2024 14:21 | 80     | Normal   | Anna Maria Bigatti |
| 1611                      | CoCoALib-0.99880 | New         | Documentation for PrimaryDecomposition   | 16 Feb 2024 09:42 | 0      | Normal   |                    |
| 1607                      | CoCoALib-0.99900 | New         | Coding guidelines  | 16 Feb 2024 10:02 | 0      | Normal   |                    |
| 1584                      | CoCoALib-1.0     | New         | Benchmarks?  | 08 Mar 2023 19:41 | 0      | Normal   |                    |
| 1561                      | CoCoALib-0.99880 | New         | Doc for module term orderings  | 08 Mar 2024 17:38 | 0      | High     |                    |
| 1510                      | CoCoALib-0.99880 | New         | Documentation for SparsePolyOps?   | 18 Mar 2024 09:45 | 30     | Normal   |                    |
| 1497                      | CoCoALib-0.99880 | New         | Doc for normaliz fns   | 08 Mar 2023 19:40 | 0      | Normal   |                    |
| 1219                      | CoCoALib-0.99880 | In Progress | Frobby version number  | 08 Mar 2023 19:40 | 10     | Normal   |                    |
| 1134                      | CoCoALib-1.0     | New         | Organize better the documentation for CoCoALib   | 09 Apr 2019 10:50 | 0      | Normal   |                    |
| 1096                      | CoCoALib-1.0     | New         | WEB SITE: HTML is not clean!   | 31 Aug 2017 10:05 | 0      | Low      | Anna Maria Bigatti |
| 1066                      | CoCoALib-0.99900 | In Progress | Documentation: translation table   | 08 Mar 2024 18:16 | 30     | Normal   | Anna Maria Bigatti |
| 972                       | CoCoALib-1.0     | New         | ex-PolyIterator  | 17 Nov 2016 13:21 | 0      | Normal   |                    |
| 926                       | CoCoALib-1.0     | New         | Documentation: check layout of history at end of generated HTML files (from the txt files) | 21 Sep 2016 13:29 | 0      | Low      |                    |
| 788                       | CoCoALib-1.0     | New         | No doc for DistrMPolyInIFpPP   | 22 Oct 2015 13:49 | 0      | Normal   |                    |

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| 676                   | CoCoALib-1.0     | In Progress | Credits to CoCoALib contributors  | 28 Apr 2017 11:06 | 10     | Normal   | Anna Maria Bigatti |
| 624                   | CoCoALib-1.0     | New         | Wikipedia   | 06 Nov 2017 13:40 | 0      | Normal   | Anna Maria Bigatti |
| 569                   | CoCoALib-1.0     | New         | Documentation for ReductionCog  | 11 Jun 2014 16:04 | 0      | Normal   |                    |
| 505                   | CoCoALib-1.0     | New         | Documentation: write doc for RingDenseUPolyClean                          | 21 Sep 2016 17:15 | 0      | Normal   | Anna Maria Bigatti |
| 353                   | CoCoALib-1.0     | In Progress | Missing documentation and tests for myRecvTwinFloat                       | 14 Jul 2014 14:40 | 0      | Normal   | John Abbott        |
| 315                   | CoCoALib-1.0     | New         | Add doc for ApproxPts2  | 10 Jul 2014 16:23 | 0      | Normal   |                    |
| 231                   | CoCoALib-1.0     | New         | Documentation for QBGenerator needs to be improved.                       | 09 Jul 2014 18:06 | 0      | Normal   |                    |
| 205                   | CoCoALib-1.0     | New         | Example for change of coordinates with coeffs in a matrix                 | 14 Jul 2014 14:39 | 0      | Normal   | Anna Maria Bigatti |
| 196                   | CoCoALib-1.0     | New         | PPWithMask needs checking   | 04 Apr 2014 17:50 | 0      | Normal   | Anna Maria Bigatti |
| 161                   | CoCoALib-1.0     | New         | Convert old "task table" into redmine                                     | 07 Apr 2014 14:35 | 0      | Normal   |                    |
| 112                   | CoCoALib-1.0     | New         | automatic creation of all function signatures                             | 07 Apr 2014 14:34 | 0      | Normal   |                    |
| 76                    | CoCoALib-1.0     | New         | keywords in documentation   | 04 Apr 2014 17:51 | 0      | Low      |                    |
| 59                    | CoCoALib-1.0     | New         | List of all functions in CoCoALib   | 08 Mar 2023 19:44 | 10     | Low      |                    |
| 26                    | CoCoALib-0.99900 | In Progress | Redmine Administration  | 23 Feb 2024 10:59 | 80     | High     | Anna Maria Bigatti |
| <b>Improving (96)</b> |                  |             |   |                   |        |          |                    |
| 1802                  | CoCoALib-0.99900 | New         | Tidying ideal generators (for non-polynomial ideals)                      | 25 Mar 2024 19:05 | 0      | Normal   |                    |
| 1798                  | CoCoALib-0.99880 | New         | Computing in sub polyring   | 22 Mar 2024 09:30 | 0      | Normal   |                    |
| 1796                  | CoCoALib-0.99880 | New         | myFinalizeGBasis ("Final clean up") should be more flexible               | 22 Mar 2024 16:19 | 30     | Normal   | Anna Maria Bigatti |
| 1793                  | CoCoALib-0.99880 | In Progress | Use ErrorContext instead of string FnName                                 | 26 Mar 2024 11:50 | 60     | Normal   |                    |
| 1786                  | CoCoALib-0.99900 | New         | Add new function for IsInRadical for monomial ideals? (RadicalMembership) | 01 Mar 2024 18:37 | 10     | Normal   | Anna Maria Bigatti |
| 1764                  | CoCoALib-0.99880 | In Progress | Verbosity messages: avoid printing BIG values                             | 25 Apr 2024 21:44 | 10     | Low      |                    |
| 1757                  | CoCoALib-0.99880 | New         | gcd(f,f) is slow  | 16 Feb 2024 09:57 | 0      | Normal   |                    |
| 1756                  | CoCoALib-0.99880 | In Progress | deg(f) is slow if f is long   | 21 Mar 2024 20:40 | 50     | Normal   | John Abbott        |
| 1750                  | CoCoALib-0.99880 | In Progress | IdealOfPoints: allow duplicate points?                                    | 08 Mar 2024 18:23 | 20     | Normal   | John Abbott        |
| 1742                  | CoCoALib-0.99880 | New         | MinGens could be faster   | 18 May 2023 13:44 | 10     | Normal   | Anna Maria Bigatti |
| 1737                  | CoCoALib-0.99880 | In Progress | Homogenization of an ideal with ZZ^1-grading                              | 01 Feb 2024 19:59 | 20     | Normal   | Anna Maria Bigatti |

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| 1733 | CoCoALib-0.99880 | Resolved    | FactorINT: funny order   | 22 Apr 2024 19:51 | 60     | Low       | John Abbott        |
| 1730 | CoCoALib-0.99880 | New         | ApplySPRCodomain: relax power/exponent check                   | 27 Nov 2023 20:30 | 0      | Normal    |                    |
| 1706 | CoCoALib-1.0     | New         | slimgb: Brickenstein, singular                                 | 30 Oct 2022 20:30 | 0      | Normal    |                    |
| 1705 | CoCoALib-0.99880 | In Progress | ProgressReporter: prepare for new loop?                        | 25 Apr 2024 21:40 | 80     | Normal    | John Abbott        |
| 1692 | CoCoALib-0.99900 | In Progress | Suggestion: Add "JumpTo" function to prime iterators           | 15 Feb 2024 22:39 | 10     | Normal    |                    |
| 1685 | CoCoALib-0.99880 | In Progress | RingBase::mySwap needed?                                       | 07 Mar 2024 20:49 | 10     | Normal    |                    |
| 1683 | CoCoALib-0.99880 | New         | Islrred in ZZ[x,y]   | 16 Feb 2024 09:39 | 0      | Immediate | John Abbott        |
| 1682 | CoCoALib-0.99900 | In Progress | swap for new classes   | 16 Feb 2024 09:35 | 10     | Normal    |                    |
| 1668 | CoCoALib-0.99880 | New         | Generalize prim  | 31 Jan 2024 22:03 | 0      | Normal    |                    |
| 1667 | CoCoALib-0.99880 | In Progress | GBasis over ZZ: port to CoCoALib                               | 29 Apr 2024 21:13 | 10     | Urgent    |                    |
| 1657 | CoCoALib-0.99880 | New         | Improve CertifyNotPower  | 31 Jan 2024 22:03 | 0      | Normal    |                    |
| 1645 | CoCoALib-0.99900 | In Progress | Implement monic0(f) for the case monic(0)?                     | 16 Feb 2024 09:38 | 10     | Normal    |                    |
| 1643 | CoCoALib-0.99880 | New         | rref slower than expected (maybe) [[reduced row echelon form]] | 01 Mar 2024 09:54 | 0      | Normal    |                    |
| 1642 | CoCoALib-0.99880 | In Progress | interreduce: make monic if over finite field?                  | 16 Feb 2024 20:44 | 20     | Normal    | John Abbott        |
| 1637 | CoCoALib-0.99900 | New         | Intersection of Ideals: has GBasis?                            | 16 Feb 2024 17:25 | 0      | Low       |                    |
| 1588 | CoCoALib-0.99900 | New         | ElimMat is slow  | 22 Mar 2024 09:29 | 0      | Low       |                    |
| 1582 | CoCoALib-0.99900 | New         | Factorization in K(a,b)[x,y]                                   | 07 Mar 2024 20:23 | 0      | Normal    |                    |
| 1576 | CoCoALib-0.99880 | In Progress | cmp for machine integers                                       | 21 Jan 2024 20:23 | 20     | Normal    | John Abbott        |
| 1572 | CoCoALib-0.99880 | Resolved    | Use noexcept   | 23 Apr 2024 21:57 | 70     | Normal    | John Abbott        |
| 1559 | CoCoALib-0.99880 | In Progress | Default ctor for rings   | 13 Mar 2024 20:42 | 10     | Normal    |                    |
| 1518 | CoCoALib-0.99900 | In Progress | SLUG: Printing PPs with many indets                            | 15 Feb 2024 22:45 | 20     | Normal    |                    |
| 1513 | CoCoALib-0.99880 | New         | Better test for univariate-ness (and better conversion)        | 16 Mar 2024 21:38 | 0      | Normal    |                    |
| 1492 | CoCoALib-0.99900 | New         | submat of a submat   | 16 Feb 2024 17:28 | 0      | Low       |                    |
| 1485 | CoCoALib-0.99880 | New         | Simple syntax for making a quotient ring?                      | 08 Mar 2023 19:51 | 0      | Normal    |                    |
| 1446 | CoCoALib-0.99880 | In Progress | Start using C++14 "move" capability                            | 08 Mar 2024 18:00 | 10     | Normal    |                    |
| 1419 | CoCoALib-1.0     | New         | DynamicBitset::lamAll1s  | 03 Feb 2021 18:18 | 0      | Low       |                    |
| 1417 | CoCoALib-0.99880 | In Progress | RadicalZeroDim with extra parameter for GBasis timeout         | 16 Mar 2024 21:42 | 20     | Normal    | Anna Maria Bigatti |
| 1394 | CoCoALib-0.99880 | Resolved    | Oddly slow GBasis computation (slow final cleanup)             | 16 Apr 2024 22:46 | 70     | Low       | Anna Maria Bigatti |
| 1378 | CoCoALib-1.0     | New         | Create two separate radical fns (for 0-dim ideals)             | 03 Jul 2023 17:49 | 0      | Normal    |                    |
| 1371 | CoCoALib-1.0     | In Progress | French students' example with GFan                             | 27 Nov 2019 15:53 | 10     | Low       |                    |
| 1370 | CoCoALib-0.99880 | New         | RingID counter increased inside some functions                 | 31 Jan 2024 22:19 | 0      | Low       |                    |
| 1369 | CoCoALib-1.0     | In Progress | RandomUnimodularMat is slow with many iters                    | 09 Jan 2020 12:19 | 10     | Low       |                    |

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| 1359 | CoCoALib-1.0     | New         | gcd: low degree but big coeffs can be slow   | 30 Oct 2019 22:23 | 0      | Normal   |                    |
| 1349 | CoCoALib-0.99880 | In Progress | ideal ctor where given gens are a gbasis   | 16 Feb 2024 09:52 | 10     | Normal   |                    |
| 1346 | CoCoALib-0.99880 | In Progress | C++14: use the new for loop syntax where appropriate (like cocoa's foreach)              | 22 Apr 2024 21:08 | 80     | Normal   |                    |
| 1337 | CoCoALib-0.99880 | In Progress | PrimaryDecomposition: a interesting/pathological example                                 | 08 Mar 2023 21:13 | 10     | Normal   | Anna Maria Bigatti |
| 1324 | CoCoALib-1.0     | In Progress | Improve RootBound  | 30 Oct 2019 21:44 | 10     | Normal   |                    |
| 1323 | CoCoALib-1.0     | New         | Improve RealRoots: compute sqfr decomp   | 30 Sep 2019 16:14 | 0      | Normal   |                    |
| 1280 | CoCoALib-0.99880 | In Progress | Determinant & Inverse of matrix over non integral domain                                 | 21 Jan 2024 19:43 | 40     | High     | John Abbott        |
| 1269 | CoCoALib-1.0     | New         | Ideal Ops: sort-cuts for trivial args?   | 04 Apr 2019 15:07 | 0      | Normal   |                    |
| 1267 | CoCoALib-1.0     | In Progress | Ideal equality   | 09 Apr 2019 17:48 | 10     | Normal   |                    |
| 1266 | CoCoALib-1.0     | New         | Make a poly ring QQ[x,y,z] also contain a ZZ[x,y,z]                                      | 28 Mar 2019 16:42 | 0      | Normal   |                    |
| 1255 | CoCoALib-0.99880 | New         | Ideals with trivial GBasis   | 08 Mar 2023 19:49 | 0      | Normal   |                    |
| 1187 | CoCoALib-1.0     | New         | Matrix rank is slow (over QQ)  | 26 Jun 2018 11:29 | 0      | Normal   |                    |
| 1156 | CoCoALib-1.0     | New         | Printing for RingElem  | 08 Jan 2020 23:02 | 0      | Normal   |                    |
| 1130 | CoCoALib-1.0     | In Progress | SqFreeFactor: should it work over ZZ?  | 05 Apr 2019 15:39 | 10     | Normal   |                    |
| 1118 | CoCoALib-0.99880 | In Progress | SLUG: factorization of $x^{9999}$  | 31 Jan 2024 22:20 | 10     | Low      |                    |
| 1117 | CoCoALib-1.0     | In Progress | Better printing of negative coeffs   | 23 Sep 2019 11:52 | 10     | Normal   |                    |
| 1103 | CoCoALib-1.0     | In Progress | Pseudo-zero-dim ideals   | 05 Nov 2021 16:09 | 30     | Normal   | Anna Maria Bigatti |
| 1070 | CoCoALib-1.0     | New         | Slug: MakeTermOrd (rk calls in RemoveRedundantRows)                                      | 17 May 2017 13:47 | 10     | Normal   | Anna Maria Bigatti |
| 1069 | CoCoALib-1.0     | In Progress | GroebnerFan: ERROR: Matrix must be invertible  | 17 Dec 2018 15:16 | 10     | Normal   |                    |
| 1059 | CoCoALib-1.0     | New         | Printing ring for ideals (or just for ideals 0 and 1)                                    | 05 May 2017 16:58 | 10     | Normal   |                    |
| 1057 | CoCoALib-0.99880 | In Progress | Slug: Polynomial ring constructor slow with (big) matrix ordering                        | 22 Mar 2024 09:31 | 50     | High     | Anna Maria Bigatti |
| 987  | CoCoALib-1.0     | New         | GCD: add special case if args are monomials  | 28 Nov 2016 22:04 | 0      | Normal   |                    |
| 974  | CoCoALib-1.0     | In Progress | QIR/RealRootRefine: improve behaviour if input interval has "nasty" endpoints            | 01 Mar 2021 21:25 | 10     | Normal   |                    |
| 970  | CoCoALib-1.0     | In Progress | Weights in ElimMat?  | 11 Nov 2016 15:49 | 10     | Normal   |                    |
| 968  | CoCoALib-1.0     | In Progress | Slow NF example  | 10 Nov 2016 21:33 | 10     | Normal   |                    |
| 967  | CoCoALib-0.99880 | Resolved    | Improve saturate   | 22 Mar 2024 10:18 | 70     | Normal   | Anna Maria Bigatti |
| 930  | CoCoALib-1.0     | New         | Printing TwinFloat as (rational) coeff without brackets                                  | 24 Sep 2016 21:43 | 0      | Low      |                    |
| 904  | CoCoALib-1.0     | New         | SmallFpDouble: which impl of InvMod to use?  | 04 Jul 2016 13:45 | 0      | Normal   |                    |
| 896  | CoCoALib-1.0     | In Progress | myIsEqual, myCmp: direct comparisons between RingElem and MachineInt, BigInt and BigRat? | 25 Jun 2018 15:31 | 10     | Normal   |                    |

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| 884                   | CoCoALib-1.0     | New         | DistrMPolyInIPP::myPushFront and DistrMPolyInIPP::myPushBack inefficient if arg is a PP | 24 May 2016 15:25 | 0      | Normal   |                    |
| 882                   | CoCoALib-1.0     | New         | Impl faster multiplication for DUP (dense univariate polys)                             | 09 May 2016 22:10 | 0      | Normal   |                    |
| 874                   | CoCoALib-1.0     | In Progress | factor: too slow on largish multivariate poly   | 26 Feb 2019 16:29 | 20     | Normal   | John Abbott        |
| 872                   | CoCoALib-0.99880 | In Progress | LinSolve for matrices over FFp  | 08 Mar 2024 17:36 | 30     | Urgent   | John Abbott        |
| 869                   | CoCoALib-1.0     | New         | SmallFpImpl: different repr for computation and for storage?                            | 22 Apr 2016 15:14 | 0      | Normal   |                    |
| 846                   | CoCoALib-1.0     | In Progress | Islrred: correct design?  | 26 Feb 2019 16:32 | 20     | Normal   | John Abbott        |
| 842                   | CoCoALib-1.0     | New         | PPMonoidSparse: comparisons are VERY SLOW   | 15 Feb 2016 13:57 | 0      | Normal   |                    |
| 839                   | CoCoALib-1.0     | In Progress | SparsePolyIter: make more compatible with STL   | 07 Mar 2024 20:01 | 10     | Low      |                    |
| 837                   | CoCoALib-1.0     | New         | factor is very slow on some simple input polynomials                                    | 06 Jan 2016 14:40 | 0      | Normal   |                    |
| 799                   | CoCoALib-1.0     | In Progress | vector of "indets" in each PPMonoid?  | 11 Nov 2015 13:47 | 20     | Low      | John Abbott        |
| 797                   | CoCoALib-1.0     | In Progress | SmallFpImpl: make it faster   | 24 Apr 2024 23:04 | 20     | Normal   | John Abbott        |
| 785                   | CoCoALib-1.0     | New         | finite fields: global register of fields already created?                               | 15 Oct 2015 17:27 | 0      | Normal   |                    |
| 780                   | CoCoALib-1.0     | In Progress | GroebnerFan/ExternalLib-GFan: improve package   | 21 Apr 2017 11:06 | 20     | Normal   | Anna Maria Bigatti |
| 777                   | CoCoALib-0.99880 | In Progress | SLUG: elimination   | 22 Mar 2024 18:12 | 10     | Normal   | Anna Maria Bigatti |
| 775                   | CoCoALib-1.0     | New         | PPMonoid with 1 extra "exponent"?   | 15 Sep 2015 20:18 | 0      | Low      |                    |
| 758                   | CoCoALib-1.0     | In Progress | configure: have option to say to look for external libs                                 | 03 Sep 2015 11:41 | 10     | Normal   |                    |
| 743                   | CoCoALib-0.99880 | In Progress | Better errors: give supplementary info about the error                                  | 15 Mar 2024 18:33 | 10     | Urgent   |                    |
| 742                   | CoCoALib-1.0     | In Progress | View PP exponent vector (and order vector?) as an array of long?                        | 01 Sep 2015 12:08 | 10     | Normal   |                    |
| 740                   | CoCoALib-1.0     | New         | Addition of sparse (multivariate) polynomials   | 17 Jun 2016 14:35 | 0      | Normal   |                    |
| 710                   | CoCoALib-0.99880 | In Progress | Update normaliz interface?  | 16 Feb 2024 18:25 | 10     | Normal   |                    |
| 688                   | CoCoALib-1.0     | New         | PolyAlgebraHom (PolyRingHom) evaluate multivariate polynomials                          | 22 Apr 2015 14:38 | 10     | Normal   |                    |
| 598                   | CoCoALib-0.99880 | In Progress | Syzygy for modules: non-homogeneous module  | 27 Mar 2024 17:31 | 40     | Normal   | Anna Maria Bigatti |
| 420                   | CoCoALib-1.0     | New         | Allow user to give a name to a ring   | 13 May 2015 09:55 | 0      | Normal   |                    |
| 329                   | CoCoALib-1.0     | New         | Why is DMPI slower than DMPClean?   | 13 May 2015 09:54 | 0      | Normal   |                    |
| <b>Makefile (2)</b>   |                  |             |   |                   |        |          |                    |
| 779                   | CoCoALib-1.0     | New         | Makefile: problem not seeing when files in TmpFactorDir need to be rebuilt              | 17 Sep 2015 22:10 | 0      | Low      |                    |
| 149                   | CoCoALib-1.0     | New         | Makefile dependencies   | 01 Aug 2014 08:59 | 0      | Normal   |                    |
| <b>Maths Bugs (5)</b> |                  |             |   |                   |        |          |                    |
| 1740                  | CoCoALib-0.99880 | In Progress | MinGens gives non minimal gens *if some deg=0*  | 22 Mar 2024 18:04 | 30     | High     | Anna Maria Bigatti |

| #                         | Target version   | Status      | Subject   | Updated           | % Done | Priority | Assignee           |
|---------------------------|------------------|-------------|---|-------------------|--------|----------|--------------------|
| 1571                      | CoCoALib-0.99880 | New         | ker_H needs care  | 16 Feb 2024 17:49 | 10     | Normal   | Anna Maria Bigatti |
| 1281                      | CoCoALib-0.99880 | New         | Factor of multivariate sometimes prints ERROR                           | 21 Jan 2024 20:03 | 10     | High     |                    |
| 1233                      | CoCoALib-0.99880 | Resolved    | factor SEGV -- too large characteristic                                 | 14 Mar 2023 19:45 | 60     | High     | John Abbott        |
| 1026                      | CoCoALib-1.0     | New         | JanetBasis gives error indet index out of range                         | 08 Mar 2017 15:26 | 0      | Normal   |                    |
| <b>New Function (106)</b> |                  |             |   |                   |        |          |                    |
| 1815                      | CoCoALib-0.99900 | In Progress | JSON and UUID   | 02 May 2024 19:58 | 10     | Normal   |                    |
| 1808                      | CoCoALib-0.99880 | In Progress | New constructor for PolyRing with elimination ordering                  | 28 Mar 2024 07:35 | 10     | Normal   | Anna Maria Bigatti |
| 1797                      | CoCoALib-0.99900 | New         | Add a function CleanupGens making some easy cleaning on the generators? | 25 Mar 2024 19:16 | 0      | Normal   |                    |
| 1785                      | CoCoALib-0.99900 | New         | Add function IsHomog3(l)?   | 01 Mar 2024 14:53 | 0      | Normal   |                    |
| 1778                      | CoCoALib-0.99880 | In Progress | Homogenizer   | 25 Apr 2024 21:54 | 10     | Normal   |                    |
| 1743                      | CoCoALib-0.99880 | New         | Implement Truncated GBases for homogeneous input                        | 19 May 2023 15:42 | 0      | Normal   | Anna Maria Bigatti |
| 1715                      | CoCoALib-0.99880 | New         | ProductBigInt (also ProductBigRat???)                                   | 23 Jan 2024 22:14 | 0      | Low      |                    |
| 1652                      | CoCoALib-0.99900 | In Progress | Add LM to cocoalib ?  | 15 Feb 2024 22:41 | 10     | Low      |                    |
| 1635                      | CoCoALib-0.99880 | In Progress | NR for polys with coeffs in PID   | 16 Feb 2024 09:39 | 10     | Normal   |                    |
| 1602                      | CoCoALib-0.99900 | New         | Sparse matrix (SparseMat)   | 15 Feb 2024 22:42 | 0      | Low      |                    |
| 1532                      | CoCoALib-0.99900 | In Progress | Convenient RingHom pseudo-ctors   | 07 Mar 2024 21:34 | 10     | Normal   |                    |
| 1482                      | CoCoALib-0.99900 | In Progress | Extended rationals: PlusInfinity and MinusInfinity                      | 16 Feb 2024 18:02 | 10     | Normal   |                    |
| 1472                      | CoCoALib-0.99900 | In Progress | Idea for for loops  | 16 Feb 2024 09:55 | 10     | Low      |                    |
| 1470                      | CoCoALib-0.99900 | New         | Get indexed indets from a polyring                                      | 07 Mar 2024 20:36 | 0      | Normal   |                    |
| 1468                      | CoCoALib-0.99900 | In Progress | Adjoin indets to a poly ring  | 15 Feb 2024 22:45 | 10     | Normal   |                    |
| 1444                      | CoCoALib-0.99880 | New         | HNF: Hermite Normal Form  | 16 Feb 2024 09:53 | 0      | Normal   |                    |
| 1441                      | CoCoALib-0.99900 | New         | GFan: port CoCoA_5 functions into CoCoALib                              | 16 Feb 2024 17:54 | 0      | Normal   | Anna Maria Bigatti |
| 1437                      | CoCoALib-0.99900 | New         | Filling matrix row/col from a vector                                    | 15 Feb 2024 22:46 | 0      | Normal   |                    |
| 1433                      | CoCoALib-0.99900 | New         | HilbertDriven Buchberger Algorithm                                      | 16 Feb 2024 18:02 | 0      | Normal   | Anna Maria Bigatti |
| 1339                      | CoCoALib-1.0     | New         | All PPs of given wdeg   | 16 Oct 2019 14:04 | 0      | Normal   |                    |
| 1306                      | CoCoALib-0.99880 | In Progress | exgcd over integers (ZZ)  | 08 Mar 2024 17:57 | 20     | Normal   |                    |
| 1282                      | CoCoALib-0.99900 | New         | subresultant  | 08 Mar 2024 17:54 | 20     | Normal   |                    |
| 1278                      | CoCoALib-1.0     | New         | Port old "clever" code for matrix determinant over ZZ to CoCoALib       | 03 May 2019 11:42 | 0      | Normal   |                    |
| 1254                      | CoCoALib-0.99880 | New         | New function: MinPoly for pseudo-zero-dimensional ideals                | 07 Mar 2024 20:25 | 0      | Normal   | Anna Maria Bigatti |

| #    | Target version     | Status      | Subject   | Updated           | % Done | Priority  | Assignee           |
|------|--------------------|-------------|---|-------------------|--------|-----------|--------------------|
| 1227 | CoCoALib-1.0       | New         | exgcd; solve Bezout equation  | 29 Aug 2019 14:55 | 0      | Normal    |                    |
| 1207 | CoCoALib-0.99880   | New         | New function: SubmoduleOfGBasis   | 18 Mar 2024 09:33 | 0      | Normal    |                    |
| 1198 | CoCoALib-1.0       | New         | Non-standard DegRevLex (NonStdDegRevLex, WDegRevLex)  | 23 Sep 2019 12:44 | 0      | Normal    |                    |
| 1197 | CoCoALib-0.99880   | In Progress | IsZeroDet: new fn   | 08 Mar 2024 17:58 | 40     | Normal    | John Abbott        |
| 1176 | CoCoALib-0.99880   | In Progress | interval arithmetic   | 10 Mar 2023 17:46 | 50     | Normal    | John Abbott        |
| 1173 | CoCoALib-1.0       | New         | Upper bound for value of poly in an interval  | 04 Apr 2018 11:55 | 0      | Normal    |                    |
| 1150 | CoCoALib-1.0       | New         | New fn: transform ideal with ring hom   | 22 Jun 2020 10:34 | 0      | Normal    |                    |
| 1132 | CoCoALib-0.99880   | New         | Canonical homomorphism for (some) polynomial rings?   | 08 Mar 2024 18:01 | 0      | Normal    | Anna Maria Bigatti |
| 1094 | CoCoALib-0.99880   | In Progress | Revive code for SelfSaturating GBasis   | 22 Mar 2024 14:38 | 50     | Normal    | Anna Maria Bigatti |
| 1022 | CoCoALib-1.0       | New         | New "LF" function which is based on StdDeg  | 06 Mar 2017 19:37 | 20     | Normal    |                    |
| 1001 | removed/duplicates | In Progress | CoCoALib: ideas for student projects  | 18 Feb 2022 16:57 | 10     | Normal    |                    |
| 992  | CoCoALib-1.0       | New         | Poly ring homomorphism to change ordering   | 13 Dec 2016 18:04 | 0      | Normal    |                    |
| 958  | CoCoALib-0.99880   | Resolved    | New function: multiplicity and dim  | 08 Mar 2024 18:15 | 80     | Normal    | Anna Maria Bigatti |
| 949  | CoCoALib-0.99900   | New         | New function: IdealWithIncrementalGBasis(l, f)  | 16 Feb 2024 18:03 | 0      | Normal    | Anna Maria Bigatti |
| 947  | CoCoALib-0.99880   | In Progress | IsRadical for ideal?  | 23 Jan 2024 22:13 | 10     | Normal    |                    |
| 937  | CoCoALib-1.0       | In Progress | LinDepMill: Mill for linear dependencies  | 18 Apr 2024 16:38 | 10     | Normal    | Anna Maria Bigatti |
| 923  | CoCoALib-1.0       | New         | Fn to read symbol range (SymbolRange)   | 16 Sep 2016 15:04 | 0      | Normal    |                    |
| 914  | CoCoALib-1.0       | New         | New function: quorem for univariate polynomials?  | 22 Aug 2016 16:45 | 0      | Normal    |                    |
| 913  | CoCoALib-1.0       | New         | Read input from SymbolicData database   | 02 Aug 2016 10:55 | 0      | Normal    | Anna Maria Bigatti |
| 898  | CoCoALib-0.99880   | In Progress | New function: cardinality of finite field?  | 08 Mar 2024 17:45 | 20     | High      | Anna Maria Bigatti |
| 885  | CoCoALib-1.0       | In Progress | Islrred3: fast 3-way irred test (returning bool3)   | 30 Apr 2019 17:19 | 10     | Normal    |                    |
| 873  | CoCoALib-1.0       | In Progress | bool3: add some logical operations?   | 21 Jun 2016 14:37 | 10     | Normal    |                    |
| 840  | CoCoALib-1.0       | In Progress | GINV: alex basis  | 31 Mar 2016 13:05 | 10     | Normal    |                    |
| 838  | CoCoALib-1.0       | In Progress | Differential algebra  | 24 Oct 2016 15:32 | 10     | Normal    |                    |
| 828  | CoCoALib-1.0       | In Progress | MachineInt: function for checking that value is greater than some lower limit (and below MAXLONG) | 15 Apr 2024 10:08 | 20     | Normal    | John Abbott        |
| 817  | CoCoALib-1.0       | New         | GenRepr in CoCoALib?  | 17 Nov 2016 14:12 | 0      | High      |                    |
| 813  | CoCoALib-0.99880   | Feedback    | Implement "elim" in CoCoALib  | 18 Mar 2024 15:58 | 90     | Immediate | Anna Maria Bigatti |



| #   | Target version   | Status      | Subject  | Updated           | % Done | Priority | Assignee           |
|-----|------------------|-------------|--|-------------------|--------|----------|--------------------|
| 812 | CoCoALib-1.0     | New         | PPMonoid pseudo-ctor without explicit ordering                                   | 24 Nov 2015 18:16 | 0      | Normal   |                    |
| 803 | CoCoALib-1.0     | In Progress | PPOrdering: use it to compute WDeg?  | 06 Nov 2017 14:00 | 10     | Normal   |                    |
| 802 | CoCoALib-0.99880 | In Progress | DivMask: extend interface?   | 08 Mar 2024 17:36 | 50     | Urgent   | John Abbott        |
| 801 | CoCoALib-0.99880 | New         | Test whether a symbol is in a ring   | 07 Mar 2024 21:36 | 0      | Normal   |                    |
| 738 | CoCoALib-1.0     | In Progress | Extend homomorphism to polynomial ring   | 25 Jun 2015 17:23 | 10     | Normal   |                    |
| 728 | CoCoALib-1.0     | In Progress | Noncommutative algebra "of solvable type"  | 09 Jul 2015 08:39 | 10     | Normal   |                    |
| 703 | CoCoALib-1.0     | New         | Add more operations between modules (CoCoALib)                                   | 27 Oct 2017 11:53 | 10     | Normal   | Anna Maria Bigatti |
| 690 | CoCoALib-1.0     | New         | Fault tolerant rational reconstruction: implement simultaneous version           | 23 Apr 2015 19:12 | 0      | Normal   |                    |
| 678 | CoCoALib-1.0     | In Progress | Accumulator (like a geobucket)   | 17 Nov 2016 19:03 | 20     | Normal   |                    |
| 667 | CoCoALib-1.0     | New         | factor: multivariate + finite characteristic                                     | 04 Mar 2015 20:08 | 0      | Normal   |                    |
| 665 | CoCoALib-1.0     | In Progress | Integrate Janet/Pommaret basis code  | 12 Jun 2018 18:36 | 10     | Normal   | John Abbott        |
| 664 | CoCoALib-0.99880 | Resolved    | Impl small non-prime finite fields (using logs)                                  | 14 Mar 2023 19:49 | 80     | Urgent   | John Abbott        |
| 661 | CoCoALib-1.0     | New         | Laurent polynomials  | 23 Jan 2015 13:50 | 0      | Normal   |                    |
| 651 | CoCoALib-1.0     | In Progress | Optimized algorithms for implicitization (slicing algorithm, elim, subalgebra..) | 12 Feb 2015 10:33 | 10     | Normal   |                    |
| 644 | CoCoALib-1.0     | New         | Buchberger-Moeller: add option to stop as soon as 1 poly has been found          | 06 Nov 2017 13:58 | 0      | Normal   | John Abbott        |
| 628 | CoCoALib-1.0     | New         | Complex twin-floats  | 22 Sep 2014 18:16 | 0      | Normal   |                    |
| 627 | CoCoALib-1.0     | New         | Gaussian integer and rationals ZZi, QQi  | 23 Sep 2014 16:30 | 0      | Normal   |                    |
| 620 | CoCoALib-1.0     | In Progress | Redesign CRTMill   | 21 Mar 2016 14:30 | 20     | Normal   | John Abbott        |
| 589 | CoCoALib-1.0     | New         | Implement gin (generic initial ideal) in cocoalib                                | 15 Jul 2014 18:17 | 0      | Normal   | Anna Maria Bigatti |
| 583 | CoCoALib-1.0     | New         | New function for printing with extra information                                 | 07 Jul 2014 11:48 | 0      | Normal   |                    |
| 570 | CoCoALib-1.0     | New         | Allow use of RingElem instead of ring in some functions (e.g. PPM, CoeffRing)    | 16 Jul 2014 14:43 | 0      | Normal   |                    |
| 565 | CoCoALib-1.0     | In Progress | FloatApprox for TwinFloat values?  | 19 Jul 2016 22:44 | 20     | Normal   | John Abbott        |
| 539 | CoCoALib-1.0     | New         | Functions to clean up a factorization  | 22 Jan 2024 20:28 | 0      | Low      |                    |
| 515 | CoCoALib-1.0     | New         | Fn to "flatten" multiple polynomial extns  | 10 Jul 2014 14:22 | 0      | Normal   |                    |
| 513 | CoCoALib-1.0     | In Progress | Quick/correct flag for bool3 fns   | 10 Jul 2014 16:30 | 10     | High     |                    |
| 459 | CoCoALib-1.0     | New         | LinearSimplify: port to CoCoALib   | 20 May 2014 09:47 | 0      | Low      |                    |
| 442 | CoCoALib-1.0     | New         | Eigenvectors   | 09 Jul 2014 18:05 | 0      | Normal   |                    |
| 440 | CoCoALib-1.0     | New         | Port RealRoots to C++  | 19 Oct 2016 10:26 | 0      | High     | John Abbott        |
| 436 | CoCoALib-1.0     | New         | Improve UPoly eval at BigRat for binary rational                                 | 01 Aug 2014 08:59 | 0      | Normal   |                    |
| 409 | CoCoALib-1.0     | New         | Minimal syzygies (optimized implementation)                                      | 31 Jul 2014 12:36 | 0      | High     | Anna Maria Bigatti |
| 400 | CoCoALib-1.0     | New         | add myJBMill member field to ideal   | 15 Sep 2014 12:04 | 0      | Normal   |                    |

| #   | Target version   | Status      | Subject   | Updated           | % Done | Priority | Assignee           |
|-----|------------------|-------------|---|-------------------|--------|----------|--------------------|
| 399 | CoCoALib-1.0     | New         | add myHilbertSeries member field to ideal and (sub)module     | 30 Jul 2014 17:04 | 0      | High     | Anna Maria Bigatti |
| 387 | CoCoALib-1.0     | New         | implement algorithm(s) for resolutions                        | 30 Jul 2014 17:04 | 0      | High     | Anna Maria Bigatti |
| 386 | CoCoALib-1.0     | In Progress | add resolution data type                                      | 11 Jun 2015 14:58 | 10     | High     | Anna Maria Bigatti |
| 383 | CoCoALib-1.0     | In Progress | Resolution/morse: integrate Mario Albert's code into CoCoALib | 31 Jul 2014 14:57 | 60     | Normal   | John Abbott        |
| 337 | CoCoALib-1.0     | New         | Module homs   | 31 Jul 2014 12:40 | 0      | Normal   |                    |
| 313 | CoCoALib-0.99880 | In Progress | Elim(vector<long>) as PPOrderingCtor                          | 22 Mar 2024 18:17 | 30     | High     | Anna Maria Bigatti |
| 297 | CoCoALib-1.0     | In Progress | Modules design: brainstorming                                 | 31 Jul 2014 14:55 | 30     | Normal   |                    |
| 289 | CoCoALib-1.0     | New         | PrimeField -- new fn?   | 01 Aug 2014 08:59 | 0      | Normal   |                    |
| 246 | CoCoALib-1.0     | New         | Approx QIR  | 04 Apr 2014 17:16 | 0      | Normal   |                    |
| 229 | CoCoALib-1.0     | New         | Generator for random ring elements                            | 01 Aug 2014 08:59 | 0      | Normal   |                    |
| 227 | CoCoALib-1.0     | New         | HilbertBasis from Normaliz: full-lattice or not?              | 31 Jul 2014 12:39 | 0      | Normal   |                    |
| 206 | CoCoALib-0.99880 | In Progress | Matrix equation solving: LinKer                               | 22 Mar 2024 09:42 | 30     | Urgent   |                    |
| 174 | CoCoALib-1.0     | New         | IsStdGraded: add for PPOrdering, PPMonoid, (Sparse)PolyRing.. | 01 Aug 2014 08:59 | 0      | Normal   |                    |
| 151 | CoCoALib-1.0     | New         | Iterated CanonicalHom   | 13 May 2015 09:58 | 0      | Normal   |                    |
| 147 | CoCoALib-1.0     | In Progress | Buchberger-Moeller: impl via modular reduction                | 10 Jul 2014 14:18 | 20     | Urgent   | John Abbott        |
| 146 | CoCoALib-1.0     | New         | Buchberger-Moeller: input conversions                         | 10 Jul 2014 14:17 | 0      | Normal   |                    |
| 145 | CoCoALib-1.0     | New         | Buchberger-Moeller: fast modular impl                         | 10 Jul 2014 14:17 | 0      | Urgent   | John Abbott        |
| 143 | CoCoALib-1.0     | In Progress | Buchberger-Moeller (parent task)                              | 10 Jul 2014 14:16 | 38     | Urgent   | John Abbott        |
| 134 | CoCoALib-1.0     | New         | Convenience ring ctors and homs                               | 11 Jul 2014 12:06 | 0      | Normal   |                    |
| 129 | CoCoALib-1.0     | New         | Better GCD  | 09 Jul 2014 18:08 | 0      | Normal   |                    |
| 127 | CoCoALib-1.0     | In Progress | Convert DUPFF code to C++                                     | 28 Sep 2022 15:04 | 50     | Normal   | John Abbott        |
| 125 | CoCoALib-0.99880 | In Progress | Matrix equation solving; linear system solving                | 18 Mar 2024 10:00 | 50     | Normal   | John Abbott        |
| 123 | CoCoALib-1.0     | New         | IdealOfPoints with generic coeffs                             | 09 Jul 2014 18:15 | 0      | Normal   |                    |
| 113 | CoCoALib-1.0     | In Progress | Introduce PartialHom  | 09 Jul 2014 18:04 | 10     | Normal   | John Abbott        |

### Portability (17)

|      |                  |             |   |                   |    |        |             |
|------|------------------|-------------|---|-------------------|----|--------|-------------|
| 1804 | CoCoALib-0.99900 | In Progress | Use long long (at least sometimes)?             | 26 Apr 2024 21:09 | 80 | Normal | John Abbott |
| 1699 | CoCoALib-0.99880 | In Progress | Shell scripts: Shebang line, etc                | 16 Feb 2024 10:01 | 10 | Normal |             |
| 1670 | CoCoALib-0.99880 | New         | Build also dynamic/shared library for CoCoALib? | 07 Mar 2024 21:33 | 0  | Normal |             |
| 1632 | CoCoALib-1.0     | New         | C++17: notes about updating                     | 12 Nov 2021 18:11 | 0  | Normal |             |
| 1630 | CoCoALib-0.99900 | New         | Signal handler not portable?                    | 15 Feb 2024 22:42 | 0  | Normal |             |

| #    | Target version   | Status      | Subject   | Updated           | % Done | Priority | Assignee           |
|------|------------------|-------------|---|-------------------|--------|----------|--------------------|
| 1225 | CoCoALib-0.99900 | In Progress | Move to C++14 (skipping C++11)  | 08 Mar 2024 17:46 | 30     | High     |                    |
| 1010 | CoCoALib-1.0     | New         | C++11: Mario's Hilbert scheme code  | 20 Feb 2017 13:19 | 0      | Urgent   |                    |
| 933  | CoCoALib-0.99880 | In Progress | Separate configure scripts for CoCoALib and CoCoA-5                           | 23 Jan 2024 21:52 | 10     | Normal   | John Abbott        |
| 906  | CoCoALib-1.0     | New         | External libraries: keep copy of compatible versions?                         | 13 Jul 2016 11:19 | 0      | Normal   |                    |
| 765  | CoCoALib-1.0     | In Progress | ExternalLib-CDD: (needed by GFan)   | 11 Sep 2019 13:47 | 10     | Normal   | Anna Maria Bigatti |
| 763  | CoCoALib-1.0     | In Progress | GlobalManager: initialization compatible with initialization of external libs | 21 Mar 2016 16:55 | 10     | Normal   |                    |
| 752  | CoCoALib-1.0     | New         | Investigate using Boost.build instead of make                                 | 28 Apr 2017 11:23 | 0      | Normal   | John Abbott        |
| 617  | CoCoALib-1.0     | New         | configure: check all libraries for compatibility                              | 09 Sep 2014 12:21 | 0      | Normal   |                    |
| 591  | CoCoALib-1.0     | In Progress | Problem with template instantiation and order of include directives           | 09 Feb 2024 10:18 | 50     | Low      |                    |
| 575  | CoCoALib-1.0     | In Progress | Investigate using cmake for configuration                                     | 13 Mar 2024 21:19 | 10     | Normal   | John Abbott        |
| 326  | CoCoALib-1.0     | In Progress | C++ nasty surprises   | 07 Apr 2014 18:13 | 10     | Normal   |                    |
| 302  | CoCoALib-1.0     | In Progress | Compilation on M\$Windows: Visual Studio                                      | 22 Mar 2024 23:13 | 60     | Normal   |                    |

### Renaming (6)

|      |                  |             |   |                   |    |        |  |
|------|------------------|-------------|---|-------------------|----|--------|--|
| 1807 | CoCoALib-0.99880 | New         | Error codes: "Not..." for "blah must be ..." -- change prefix     | 26 Mar 2024 14:22 | 0  | Normal |  |
| 1193 | CoCoALib-0.99880 | New         | Naming convention mistakes  | 08 Mar 2023 20:52 | 0  | Low    |  |
| 1013 | CoCoALib-1.0     | New         | GlobalManager: name of object in examples (and tests)             | 25 Feb 2017 11:11 | 10 | Normal |  |
| 942  | CoCoALib-0.99900 | In Progress | Which names to use? Intersection/saturation vs intersect/saturate | 22 Mar 2024 10:20 | 20 | Normal |  |
| 308  | CoCoALib-0.99880 | In Progress | Error: ERR::NotNonZero instead of ERR::ZeroRingElem?              | 27 Mar 2024 17:37 | 40 | High   |  |
| 150  | CoCoALib-1.0     | In Progress | RingOf rather than owner? (and than AmbientRing, ...)             | 30 Jul 2014 17:59 | 10 | Normal |  |

### Safety (25)

|      |                  |             |   |                   |    |        |                    |
|------|------------------|-------------|---|-------------------|----|--------|--------------------|
| 1814 | CoCoALib-0.99900 | In Progress | Ensure tests do not need too much RAM                         | 23 Apr 2024 22:14 | 30 | Normal |                    |
| 1813 | CoCoALib-0.99900 | In Progress | Some tests have become slower                                 | 07 Apr 2024 21:53 | 10 | Normal |                    |
| 1703 | CoCoALib-0.99880 | Resolved    | Threadsafty, multithreading: optional fn arg (or separate fn) | 07 Mar 2024 20:04 | 80 | Normal | John Abbott        |
| 1691 | CoCoALib-0.99900 | New         | Random and threadSAFE?  | 15 Feb 2024 22:38 | 0  | Normal |                    |
| 1678 | CoCoALib-0.99880 | In Progress | Unsigned long for indexes (& sizes?)                          | 07 Mar 2024 20:25 | 10 | Normal |                    |
| 1600 | CoCoALib-0.99880 | In Progress | Detect updated versions of external libs                      | 16 Feb 2024 10:02 | 10 | Normal |                    |
| 1575 | CoCoALib-0.99880 | New         | DynamicBitset missing arg checks                              | 16 Feb 2024 09:46 | 0  | Normal | Anna Maria Bigatti |
| 1388 | CoCoALib-0.99880 | New         | GlobalManager: create SignalWatcher internally?               | 01 Mar 2024 09:49 | 0  | Normal |                    |
| 1208 | CoCoALib-1.0     | New         | New function: ThreadSAFE RandomLinearForm (CoCoALib)          | 01 Oct 2019 11:28 | 0  | Normal |                    |
| 986  | CoCoALib-1.0     | In Progress | GFan: require version newer than 0.6                          | 22 Apr 2024 20:06 | 10 | Low    |                    |
| 934  | CoCoALib-0.99880 | In Progress | MachineInt: change semantics?                                 | 22 Apr 2024 21:32 | 30 | Normal |                    |

| #   | Target version   | Status      | Subject  | Updated           | % Done | Priority | Assignee           |
|-----|------------------|-------------|--|-------------------|--------|----------|--------------------|
| 925 | CoCoALib-0.99880 | In Progress | MachineInt or long for args which are indices (yet again)                | 16 Apr 2024 22:29 | 50     | Normal   |                    |
| 894 | CoCoALib-0.99880 | In Progress | strict enum types: C++11 extension                                       | 25 Apr 2024 21:49 | 30     | Normal   | John Abbott        |
| 835 | CoCoALib-1.0     | New         | Make Mario's new code threadsafe   | 09 Dec 2015 16:48 | 0      | Normal   |                    |
| 787 | CoCoALib-1.0     | New         | Remove refcounts from RingElem?  | 19 Oct 2015 17:08 | 0      | Normal   |                    |
| 784 | CoCoALib-1.0     | In Progress | threadsafety: Scott Meyers's advice about cached values                  | 18 Jan 2016 18:12 | 10     | Normal   |                    |
| 707 | CoCoALib-0.99880 | In Progress | MatrixOrderingMod32749Impl: test and write documentation!                | 25 Apr 2024 21:46 | 50     | Normal   | Anna Maria Bigatti |
| 682 | CoCoALib-1.0     | New         | PPMonoid: add fn to check for overflow in products                       | 14 Apr 2015 11:23 | 0      | Low      |                    |
| 647 | CoCoALib-1.0     | New         | Unique copies of free modules?   | 10 Nov 2014 16:55 | 0      | Normal   |                    |
| 639 | CoCoALib-1.0     | New         | Shadow CoCoA namespace to help guarantee portability (without ambiguity) | 28 Oct 2014 15:34 | 0      | Low      |                    |
| 562 | CoCoALib-1.0     | New         | Subrings   | 29 Sep 2020 13:19 | 0      | Normal   |                    |
| 551 | CoCoALib-1.0     | New         | Reconsider overloaded virtual mem fns                                    | 09 Jul 2014 18:00 | 0      | Normal   |                    |
| 497 | CoCoALib-1.0     | New         | Clang: automatic bug finding   | 04 Apr 2014 17:20 | 0      | Normal   |                    |
| 482 | CoCoALib-1.0     | In Progress | Unique copies of rings -- smart ctor                                     | 20 Oct 2015 14:33 | 10     | Normal   |                    |
| 142 | CoCoALib-0.99880 | In Progress | Improve threadsafety   | 21 Mar 2024 20:29 | 50     | Normal   |                    |

### Tidying (62)

|      |                  |             |  |                   |    |        |                    |
|------|------------------|-------------|--|-------------------|----|--------|--------------------|
| 1811 | CoCoALib-0.99880 | Feedback    | Check include guards   | 22 Apr 2024 20:15 | 90 | Normal | John Abbott        |
| 1801 | CoCoALib-0.99880 | In Progress | BuildInfo  | 13 Apr 2024 22:18 | 10 | Normal |                    |
| 1800 | CoCoALib-0.99880 | In Progress | Conversion from SmallPrime to UNSIGNED long?                   | 15 Apr 2024 10:09 | 10 | Normal |                    |
| 1799 | CoCoALib-1.0     | New         | Clean out OLD CODE?  | 24 Mar 2024 10:52 | 0  | Normal |                    |
| 1792 | CoCoALib-0.99880 | New         | CpuTimeOut: arg of type ErrorContext?                          | 18 Mar 2024 20:50 | 0  | Normal |                    |
| 1787 | CoCoALib-0.99880 | In Progress | Iterator design: compatible with C++STL? Advancing beyond end? | 23 Apr 2024 22:26 | 30 | Normal | John Abbott        |
| 1783 | CoCoALib-0.99900 | In Progress | Code & doc structure: one-big-file or many-small-files?        | 24 Feb 2024 18:34 | 10 | Normal |                    |
| 1782 | CoCoALib-0.99880 | New         | Make CoCoALib test file for radical                            | 01 Mar 2024 09:44 | 0  | Normal | Anna Maria Bigatti |
| 1736 | CoCoALib-0.99880 | New         | Clean TmpGOperations, and remove Tmp prefix                    | 28 Apr 2023 16:01 | 0  | Normal |                    |
| 1727 | CoCoALib-0.99880 | New         | Cruft in ExtLibs-Normaliz.C                                    | 13 Mar 2023 19:01 | 0  | Normal |                    |
| 1720 | CoCoALib-0.99880 | New         | DivAlg in CoCoALib   | 25 Mar 2024 17:55 | 20 | Normal | Anna Maria Bigatti |
| 1704 | CoCoALib-0.99880 | New         | Symlink directory for external files needed by CoCoA-5         | 18 Mar 2024 09:29 | 0  | Normal | Anna Maria Bigatti |
| 1702 | CoCoALib-0.99900 | In Progress | Use C++ attributes   | 22 Apr 2024 21:26 | 10 | Low    |                    |
| 1677 | CoCoALib-0.99880 | In Progress | release-source script: use shell globbing?                     | 16 Feb 2024 10:01 | 10 | Normal |                    |
| 1669 | CoCoALib-0.99880 | New         | Review File subtree hierarchy                                  | 08 Mar 2023 19:56 | 0  | Normal |                    |

| #    | Target version   | Status      | Subject  | Updated           | % Done | Priority | Assignee           |
|------|------------------|-------------|--|-------------------|--------|----------|--------------------|
| 1666 | CoCoALib-0.99900 | In Progress | MachineInt: chase through ULL changes                                    | 16 Apr 2024 22:40 | 10     | Normal   |                    |
| 1628 | CoCoALib-0.99880 | In Progress | Unused variables, params, data members                                   | 11 Mar 2023 12:29 | 10     | Normal   |                    |
| 1609 | CoCoALib-0.99880 | New         | Clean time.C   | 08 Mar 2023 19:54 | 0      | Low      |                    |
| 1562 | CoCoALib-0.99880 | New         | matrix.H and MatrixView.H  | 08 Mar 2023 19:56 | 0      | Normal   |                    |
| 1491 | CoCoALib-1.0     | New         | Unified Gaussian reduction impl  | 08 Mar 2023 19:55 | 0      | Normal   |                    |
| 1465 | CoCoALib-0.99880 | In Progress | mul(MAT,MAT,MAT)   | 16 Feb 2024 10:04 | 10     | Normal   |                    |
| 1464 | CoCoALib-0.99880 | New         | What is the difference between InterruptReceived and InterruptedBySignal | 01 Mar 2024 09:54 | 0      | Normal   |                    |
| 1428 | CoCoALib-0.99880 | New         | DenseMatrix: use template impl for ctors from vec-vec?                   | 07 Mar 2024 20:49 | 0      | Normal   |                    |
| 1355 | CoCoALib-0.99880 | New         | TmpLDP uses srand and time   | 01 Mar 2024 09:50 | 0      | Normal   |                    |
| 1263 | CoCoALib-0.99880 | Resolved    | Tidy CoCoALib test directory   | 07 Mar 2023 20:49 | 80     | Normal   | John Abbott        |
| 1242 | CoCoALib-0.99880 | In Progress | C++14: Use type auto where appropriate                                   | 22 Apr 2024 21:08 | 40     | Normal   |                    |
| 1213 | CoCoALib-0.99900 | New         | Create PolyOps-RingElem?   | 16 Feb 2024 09:48 | 0      | Normal   |                    |
| 1179 | CoCoALib-0.99880 | In Progress | Clean up SparsePolyOps-MonomialIdeals                                    | 22 Mar 2024 09:33 | 20     | Normal   | Anna Maria Bigatti |
| 1160 | CoCoALib-1.0     | New         | Clean up revised RatReconstructByContFrac code                           | 26 Feb 2019 16:33 | 0      | Normal   | John Abbott        |
| 1147 | CoCoALib-1.0     | New         | mySquare and myPowerSmallExp   | 30 Apr 2019 17:18 | 0      | Normal   |                    |
| 1125 | CoCoALib-0.99880 | New         | Separate install script for CoCoALib?                                    | 23 Jan 2024 21:54 | 0      | Normal   | John Abbott        |
| 1098 | CoCoALib-1.0     | New         | Ctors for exceptions/errors  | 06 Sep 2017 15:27 | 0      | Normal   |                    |
| 1014 | CoCoALib-1.0     | In Progress | RowMat, ColMat with arg an empty list/vector                             | 24 Feb 2017 17:54 | 10     | Low      |                    |
| 866  | CoCoALib-0.99880 | In Progress | implicit, ImplicitHypersurface: improve output verification              | 22 Mar 2024 09:43 | 20     | Normal   |                    |
| 849  | CoCoALib-0.99880 | In Progress | Cleanup MinPoly code   | 08 Mar 2024 18:15 | 10     | Normal   | Anna Maria Bigatti |
| 841  | CoCoALib-1.0     | In Progress | NewPolyRing: tidy up the many different versions                         | 01 Sep 2017 11:30 | 10     | Normal   |                    |
| 833  | CoCoALib-1.0     | New         | UIBC: need include file in RingWeyl.C                                    | 08 Dec 2015 15:06 | 0      | Low      |                    |
| 818  | CoCoALib-1.0     | In Progress | F5 with 3 args?  | 24 Nov 2015 10:11 | 10     | Normal   | John Abbott        |
| 809  | CoCoALib-1.0     | New         | FastCmp for degree -- useful?  | 27 Nov 2015 16:06 | 0      | Normal   | Anna Maria Bigatti |
| 808  | CoCoALib-1.0     | New         | Alg Extn by non-zero dim ideal   | 18 Nov 2015 23:29 | 0      | Normal   |                    |
| 791  | CoCoALib-1.0     | New         | Clean code for DistrMPolyClean   | 02 Nov 2015 22:13 | 0      | Normal   | Anna Maria Bigatti |
| 778  | CoCoALib-1.0     | In Progress | CRTMill::myAddInfo accept modulus 1 or not?                              | 21 Mar 2016 15:16 | 0      | Normal   |                    |
| 695  | CoCoALib-1.0     | New         | Remove cruft from test files   | 08 May 2015 11:37 | 0      | Normal   |                    |
| 686  | CoCoALib-1.0     | New         | myAddMul in poly rings   | 20 Apr 2015 13:22 | 20     | Normal   | Anna Maria Bigatti |
| 685  | CoCoALib-1.0     | New         | Use DivMask inside QBGenerator   | 02 Feb 2016 14:16 | 0      | High     |                    |

| #                   | Target version   | Status      | Subject   | Updated           | % Done | Priority | Assignee           |
|---------------------|------------------|-------------|---|-------------------|--------|----------|--------------------|
| 680                 | CoCoALib-0.99880 | Resolved    | DistrMPolyClean does not use MemPool for summands?                      | 07 Mar 2023 20:49 | 70     | Normal   | John Abbott        |
| 675                 | CoCoALib-1.0     | In Progress | Matrix determinant over multivariate poly ring                          | 22 May 2015 13:45 | 10     | Normal   |                    |
| 640                 | CoCoALib-1.0     | New         | What is test-Dynamic1.C   | 29 Oct 2014 11:30 | 0      | Normal   |                    |
| 601                 | CoCoALib-0.99880 | In Progress | LongRange: in which file should it be declared/defined?                 | 08 Mar 2023 20:45 | 10     | Normal   |                    |
| 582                 | CoCoALib-0.99880 | New         | Error codes: use same code for "not poly ring" and "not elem poly ring" | 26 Mar 2024 14:36 | 30     | Normal   |                    |
| 572                 | CoCoALib-1.0     | New         | Split SparsePolyRing.H into two files? Problem with circular includes.  | 17 May 2018 16:36 | 0      | Normal   |                    |
| 537                 | CoCoALib-1.0     | New         | FloatStr uses too much memory   | 16 Apr 2014 12:01 | 0      | Low      |                    |
| 516                 | CoCoALib-1.0     | New         | Make squarefreefactor work in multiple polynomial extns                 | 10 Jul 2014 14:21 | 0      | Normal   |                    |
| 437                 | CoCoALib-1.0     | In Progress | MemPool: order free blocks?   | 13 Apr 2015 23:31 | 10     | Normal   |                    |
| 385                 | CoCoALib-0.99900 | In Progress | Design new errors using inheritance                                     | 09 Feb 2024 10:25 | 40     | Urgent   | John Abbott        |
| 316                 | CoCoALib-1.0     | In Progress | submodule constructor different from ideal                              | 10 Jul 2014 16:21 | 0      | Normal   | Anna Maria Bigatti |
| 305                 | CoCoALib-1.0     | In Progress | FreeModule: unique copy?  | 10 Dec 2023 20:43 | 10     | Normal   |                    |
| 272                 | CoCoALib-1.0     | New         | Forward declarations  | 07 Apr 2014 18:14 | 0      | Normal   |                    |
| 263                 | CoCoALib-1.0     | New         | Move the various <matrix>::mySetEntry procedures into MatrixBase        | 01 Aug 2014 16:29 | 0      | High     |                    |
| 154                 | CoCoALib-1.0     | In Progress | GCD normalization (e.g. monic)  | 24 Nov 2016 13:56 | 20     | Normal   |                    |
| 114                 | CoCoALib-1.0     | In Progress | Ideals of polynomials   | 10 Jul 2014 14:26 | 10     | Normal   |                    |
| 87                  | CoCoALib-1.0     | New         | Cleanup header for ring classes (so that they are e-diff-able)          | 10 Jul 2014 16:26 | 10     | Normal   | Anna Maria Bigatti |
| <b>Various (25)</b> |                  |             |   |                   |        |          |                    |
| 1810                | CoCoALib-0.99900 | New         | Release CoCoALib 0.99900  | 29 Mar 2024 09:00 | 0      | Normal   |                    |
| 1777                | CoCoALib-0.99880 | New         | VerificationLevel: just 3? Low, high, guaranteed?                       | 16 Feb 2024 10:00 | 0      | Normal   |                    |
| 1748                | CoCoALib-0.99880 | New         | July 2023   | 08 Mar 2024 08:29 | 0      | Normal   | John Abbott        |
| 1711                | CoCoALib-0.99880 | Feedback    | Development releases?   | 09 Mar 2023 20:56 | 90     | Normal   | Anna Maria Bigatti |
| 1687                | CoCoALib-0.99850 | In Progress | Release CoCoALib 0.99850  | 29 Mar 2024 10:42 | 50     | Normal   | Anna Maria Bigatti |
| 1542                | CoCoALib-0.99880 | In Progress | gfan does not "deinitialize"  | 08 Mar 2023 19:53 | 30     | Normal   |                    |
| 1521                | CoCoALib-0.99880 | New         | Unexpectedly slow example with larger types for SmallExponent_t         | 08 Mar 2023 19:54 | 0      | Normal   |                    |
| 1089                | CoCoALib-1.0     | In Progress | invalid pointer in "free"   | 20 Jul 2017 13:06 | 10     | Normal   | John Abbott        |
| 1049                | CoCoALib-1.0     | In Progress | GroebnerFan: slow examples  | 11 Mar 2024 11:12 | 10     | Low      |                    |
| 746                 | CoCoALib-1.0     | New         | Problem with GBasis in tower of alg extns                               | 21 Mar 2016 14:29 | 0      | Normal   |                    |
| 725                 | CoCoALib-1.0     | New         | Example database: Slow ideal equality test                              | 10 Jun 2015 14:24 | 0      | Normal   |                    |
| 681                 | CoCoALib-1.0     | New         | MemPool: make it easier to get just stats                               | 13 Apr 2015 23:25 | 0      | Low      |                    |

| #   | Target version   | Status      | Subject   | Updated           | % Done | Priority | Assignee |
|-----|------------------|-------------|---|-------------------|--------|----------|----------|
| 564 | CoCoALib-1.0     | New         | Temporary file for experimentation                | 16 Jul 2014 14:38 | 0      | Normal   |          |
| 547 | CoCoALib-1.0     | New         | elim using RingTwinFloat triggers error "SERIOUS" | 15 Jun 2016 14:35 | 0      | Normal   |          |
| 455 | CoCoALib-1.0     | New         | Which sets of generators in an ideal?             | 14 Jul 2014 15:17 | 0      | Normal   |          |
| 438 | CoCoALib-1.0     | In Progress | Polynomial multiplication (product of RingElem)   | 10 Jul 2014 16:28 | 10     | Normal   |          |
| 432 | CoCoALib-1.0     | In Progress | Semantics of IsPrintedWithMinus                   | 14 Jul 2014 18:13 | 10     | Normal   |          |
| 401 | CoCoALib-1.0     | New         | NewFreeModule of dimension 0                      | 31 Jul 2014 14:13 | 0      | Normal   |          |
| 360 | CoCoALib-1.0     | New         | CoCoAServer: what future, what issues?            | 28 Apr 2017 11:19 | 0      | Normal   |          |
| 262 | CoCoALib-0.99880 | New         | Play with GIT                                     | 08 Mar 2023 19:54 | 0      | Normal   |          |
| 232 | CoCoALib-1.0     | New         | No test for QBGenerator                           | 15 Apr 2015 20:15 | 0      | Normal   |          |
| 222 | CoCoALib-0.99880 | In Progress | Printing polynomials - spaces between terms       | 14 Mar 2023 21:27 | 30     | Normal   |          |
| 120 | CoCoALib-1.0     | New         | LT over QQ: surprisingly slow                     | 10 Jul 2014 16:26 | 0      | Normal   |          |
| 92  | CoCoALib-1.0     | In Progress | Error Codes                                       | 19 Apr 2017 08:31 | 0      | Normal   |          |
| 74  | CoCoALib-1.0     | New         | printing polynomials                              | 14 Jul 2014 11:07 | 10     | Normal   |          |