

## CoCoALib - CoCoALib Open Issues

| #                           | Target version   | Status      | Subject  | Updated           | % Done | Priority | Assignee           |
|-----------------------------|------------------|-------------|--|-------------------|--------|----------|--------------------|
| <b>None (11)</b>            |                  |             |  |                   |        |          |                    |
| 921                         | CoCoALib-1.0     | New         | Design GBMill  | 22 May 2017 14:11 | 0      | Normal   |                    |
| 277                         | CoCoALib-1.0     | New         | Eliminate class RefPPMonoidElem?                                   | 01 Aug 2014 08:59 | 0      | Normal   |                    |
| 282                         | CoCoALib-1.0     | New         | Global setting: to use IsProbPrime in place of IsPrime             | 01 Aug 2014 08:59 | 0      | Normal   |                    |
| 919                         | CoCoALib-1.0     | New         | Hilbert Driven GBasis  | 22 May 2017 14:11 | 0      | Normal   |                    |
| 1803                        | CoCoALib-0.99900 | New         | Improve trivial operations with ideal whose GBasis is [1]          | 25 Mar 2024 19:06 | 0      | Normal   | Anna Maria Bigatti |
| 1620                        |                  | New         | MinPolyQuot not documented   | 15 Oct 2021 14:24 | 0      | Normal   |                    |
| 258                         | CoCoALib-1.0     | New         | Multivariate lifting   | 01 Aug 2014 08:59 | 0      | Normal   |                    |
| 1654                        |                  | New         | New function IsInSymbols   | 12 May 2023 08:03 | 0      | Normal   |                    |
| 6                           | CoCoALib-1.0     | New         | Sort out RingElem, RefRingElem, ConstRefRingElem mess              | 01 Aug 2014 08:59 | 0      | High     | John Abbott        |
| 281                         | CoCoALib-1.0     | New         | Store unique copy of FF(p) in GlobalManager                        | 04 Apr 2014 17:10 | 0      | Normal   |                    |
| 257                         | CoCoALib-1.0     | New         | Transcribe C4 code for GCD in QQ[x]                                | 01 Aug 2014 08:59 | 0      | Normal   |                    |
| <b>Data Structures (20)</b> |                  |             |  |                   |        |          |                    |
| 550                         | CoCoALib-1.0     | New         | add myResolution member field to ideal and (sub)module             | 13 May 2015 09:57 | 0      | Normal   |                    |
| 1784                        | CoCoALib-0.99900 | New         | Add flag lhaveHomogGensValue for ideals in SparsePolyRing?         | 01 Mar 2024 14:36 | 0      | Normal   |                    |
| 729                         | CoCoALib-1.0     | In Progress | Betti numbers, betti diagram                                       | 14 Jun 2018 15:54 | 10     | Normal   |                    |
| 769                         | CoCoALib-1.0     | In Progress | CoCoALib cone  | 27 Jan 2020 15:32 | 10     | Normal   |                    |
| 130                         | CoCoALib-1.0     | New         | Design problem in ideals   | 13 May 2015 09:56 | 0      | Normal   |                    |
| 427                         | CoCoALib-1.0     | In Progress | Error names and error messages (current design)                    | 11 May 2017 10:57 | 10     | Normal   |                    |
| 1767                        | CoCoALib-0.99900 | In Progress | Finalize design for ideals in CoCoALib                             | 08 Mar 2024 17:26 | 10     | Normal   |                    |
| 924                         | CoCoALib-0.99880 | New         | FlagManager for bool/bool3 flags                                   | 16 Feb 2024 17:57 | 50     | Normal   | Anna Maria Bigatti |
| 832                         | CoCoALib-1.0     | New         | Generalize grading matrix  | 14 Mar 2024 11:29 | 20     | Low      |                    |
| 1168                        | CoCoALib-0.99900 | In Progress | ideal: does const ourGetPtr really need to be private?             | 08 Mar 2024 17:26 | 40     | Normal   |                    |
| 1744                        | CoCoALib-0.99880 | In Progress | Implement GBMill (aka Groebner Framework)                          | 25 May 2023 14:30 | 10     | Normal   | Anna Maria Bigatti |
| 1414                        | CoCoALib-0.99880 | In Progress | Make class RingElemVector?   | 08 Mar 2023 19:39 | 20     | High     |                    |
| 1115                        | CoCoALib-0.99900 | In Progress | New class: exterior algebra  | 31 Jan 2024 21:59 | 20     | Normal   | John Abbott        |
| 126                         | CoCoALib-1.0     | New         | New datastructures directory                                       | 13 May 2015 09:56 | 0      | Normal   |                    |
| 396                         | CoCoALib-1.0     | New         | PPMonoidElemAlias: redesign PPMonoidElem the same way as RingElem? | 13 May 2015 09:57 | 0      | Normal   | John Abbott        |
| 871                         | CoCoALib-0.99880 | New         | Redesign ideals  | 31 Oct 2023 11:24 | 0      | Normal   |                    |

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|---------------------------|------------------|-------------|--|-------------------|--------|----------|--------------------|
| 1422                      | CoCoALib-0.99880 | In Progress | Remove flag IhaveGBasisValue?  | 16 Feb 2024 17:56 | 10     | Normal   | Anna Maria Bigatti |
| 826                       | CoCoALib-1.0     | New         | Sparse matrices  | 02 Dec 2015 18:24 | 0      | Normal   |                    |
| 1738                      | CoCoALib-0.99880 | New         | Suggestion about Graded polynomial rings   | 05 May 2023 08:47 | 10     | Normal   |                    |
| 1381                      | CoCoALib-0.99880 | In Progress | Type ideal for ZZ[x[1..n]]   | 16 Feb 2024 09:47 | 10     | Normal   |                    |
| <b>Documentation (35)</b> |                  |             |  |                   |        |          |                    |
| 315                       | CoCoALib-1.0     | New         | Add doc for ApproxPts2   | 10 Jul 2014 16:23 | 0      | Normal   |                    |
| 112                       | CoCoALib-1.0     | New         | automatic creation of all function signatures  | 07 Apr 2014 14:34 | 0      | Normal   |                    |
| 1584                      | CoCoALib-1.0     | New         | Benchmarks?  | 08 Mar 2023 19:41 | 0      | Normal   |                    |
| 1775                      |                  | New         | CoCoALib releases on redmine   | 12 Jan 2024 13:29 | 70     | Normal   | Anna Maria Bigatti |
| 1607                      | CoCoALib-0.99900 | New         | Coding guidelines  | 16 Feb 2024 10:02 | 0      | Normal   |                    |
| 1665                      | CoCoALib-0.99880 | New         | Compilation on Windows: problems for normaliz  | 18 Mar 2024 09:27 | 0      | Normal   | Anna Maria Bigatti |
| 161                       | CoCoALib-1.0     | New         | Convert old "task table" into redmine  | 07 Apr 2014 14:35 | 0      | Normal   |                    |
| 676                       | CoCoALib-1.0     | In Progress | Credits to CoCoALib contributors   | 28 Apr 2017 11:06 | 10     | Normal   | Anna Maria Bigatti |
| 1561                      | CoCoALib-0.99880 | New         | Doc for module term orderings  | 08 Mar 2024 17:38 | 0      | High     |                    |
| 1497                      | CoCoALib-0.99880 | New         | Doc for normaliz fns   | 08 Mar 2023 19:40 | 0      | Normal   |                    |
| 1611                      | CoCoALib-0.99880 | New         | Documentation for PrimaryDecomposition   | 16 Feb 2024 09:42 | 0      | Normal   |                    |
| 231                       | CoCoALib-1.0     | New         | Documentation for QBGenerator needs to be improved.  | 09 Jul 2014 18:06 | 0      | Normal   |                    |
| 569                       | CoCoALib-1.0     | New         | Documentation for ReductionCog   | 11 Jun 2014 16:04 | 0      | Normal   |                    |
| 1510                      | CoCoALib-0.99880 | New         | Documentation for SparsePolyOps?   | 18 Mar 2024 09:45 | 30     | Normal   |                    |
| 1672                      | CoCoALib-0.99900 | New         | Documentation: a good model to follow?   | 16 Feb 2024 09:33 | 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      |                    |
| 1812                      | CoCoALib-0.99880 | New         | Documentation: indexXX.html should be recompiled if version has changed                    | 29 Mar 2024 10:37 | 0      | Normal   |                    |
| 1066                      | CoCoALib-0.99900 | In Progress | Documentation: translation table   | 08 Mar 2024 18:16 | 30     | Normal   | Anna Maria Bigatti |
| 505                       | CoCoALib-1.0     | New         | Documentation: write doc for RingDenseUPolyClean   | 21 Sep 2016 17:15 | 0      | Normal   | Anna Maria Bigatti |
| 972                       | CoCoALib-1.0     | New         | ex-PolyIterator  | 17 Nov 2016 13:21 | 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 |
| 1219                      | CoCoALib-0.99880 | In Progress | Frobby version number  | 08 Mar 2023 19:40 | 10     | Normal   |                    |

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| 1664 | CoCoALib-0.99880 | New         | geobucket: documentation                               | 08 Mar 2023 19:44 | 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      |                    |
| 1809 | CoCoALib-0.99880 | New         | Make ex-syz.C  | 28 Mar 2024 08:45 | 10     | 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        |
| 788  | CoCoALib-1.0     | New         | No doc for DistrMPolyInIFpPP                           | 22 Oct 2015 13:49 | 0      | Normal   |                    |
| 1134 | CoCoALib-1.0     | New         | Organize better the documentation for CoCoALib         | 09 Apr 2019 10:50 | 0      | Normal   |                    |
| 196  | CoCoALib-1.0     | New         | PPWithMask needs checking                              | 04 Apr 2014 17:50 | 0      | Normal   | Anna Maria Bigatti |
| 26   | CoCoALib-0.99900 | In Progress | Redmine Administration                                 | 23 Feb 2024 10:59 | 80     | High     | Anna Maria Bigatti |
| 1673 | CoCoALib-0.99880 | New         | Review examples  | 08 Mar 2023 19:45 | 0      | Normal   |                    |
| 1662 | CoCoALib-0.99880 | Resolved    | txt2tags: problem with filenames containing "_" or "-" | 09 Apr 2024 14:21 | 80     | Normal   | Anna Maria Bigatti |
| 1096 | CoCoALib-1.0     | New         | WEB SITE: HTML is not clean!                           | 31 Aug 2017 10:05 | 0      | Low      | Anna Maria Bigatti |
| 624  | CoCoALib-1.0     | New         | Wikipedia  | 06 Nov 2017 13:40 | 0      | Normal   | Anna Maria Bigatti |

### Improving (96)

|      |                  |             |   |                   |    |        |                    |
|------|------------------|-------------|---|-------------------|----|--------|--------------------|
| 1786 | CoCoALib-0.99900 | New         | Add new function for IsInRadical for monomial ideals? (RadicalMembership)   | 01 Mar 2024 18:37 | 10 | Normal | Anna Maria Bigatti |
| 740  | CoCoALib-1.0     | New         | Addition of sparse (multivariate) polynomials                               | 17 Jun 2016 14:35 | 0  | Normal |                    |
| 420  | CoCoALib-1.0     | New         | Allow user to give a name to a ring   | 13 May 2015 09:55 | 0  | Normal |                    |
| 1730 | CoCoALib-0.99880 | New         | ApplySPRCodomain: relax power/exponent check                                | 27 Nov 2023 20:30 | 0  | Normal |                    |
| 743  | CoCoALib-0.99880 | In Progress | Better errors: give supplementary info about the error                      | 15 Mar 2024 18:33 | 10 | Urgent |                    |
| 1117 | CoCoALib-1.0     | In Progress | Better printing of negative coeffs  | 23 Sep 2019 11:52 | 10 | Normal |                    |
| 1513 | CoCoALib-0.99880 | New         | Better test for univariate-ness (and better conversion)                     | 16 Mar 2024 21:38 | 0  | 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 |                    |
| 1576 | CoCoALib-0.99880 | In Progress | cmp for machine integers  | 21 Jan 2024 20:23 | 20 | Normal | John Abbott        |
| 1798 | CoCoALib-0.99880 | New         | Computing in sub polyring   | 22 Mar 2024 09:30 | 0  | Normal |                    |
| 758  | CoCoALib-1.0     | In Progress | configure: have option to say to look for external libs                     | 03 Sep 2015 11:41 | 10 | Normal |                    |
| 1378 | CoCoALib-1.0     | New         | Create two separate radical fns (for 0-dim ideals)                          | 03 Jul 2023 17:49 | 0  | Normal |                    |
| 1559 | CoCoALib-0.99880 | In Progress | Default ctor for rings  | 13 Mar 2024 20:42 | 10 | Normal |                    |
| 1756 | CoCoALib-0.99880 | In Progress | deg(f) is slow if f is long   | 21 Mar 2024 20:40 | 50 | Normal | John Abbott        |

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| 1280 | CoCoALib-0.99880 | In Progress | Determinant & Inverse of matrix over non integral domain                                | 21 Jan 2024 19:43 | 40     | High     | John Abbott        |
| 884  | CoCoALib-1.0     | New         | DistrMPolyInIPP::myPushFront and DistrMPolyInIPP::myPushBack inefficient if arg is a PP | 24 May 2016 15:25 | 0      | Normal   |                    |
| 1419 | CoCoALib-1.0     | New         | DynamicBitset::lamAll1s   | 03 Feb 2021 18:18 | 0      | Low      |                    |
| 1588 | CoCoALib-0.99900 | New         | ElimMat is slow   | 22 Mar 2024 09:29 | 0      | Low      |                    |
| 837  | CoCoALib-1.0     | New         | factor is very slow on some simple input polynomials                                    | 06 Jan 2016 14:40 | 0      | Normal   |                    |
| 874  | CoCoALib-1.0     | In Progress | factor: too slow on largish multivariate poly   | 26 Feb 2019 16:29 | 20     | Normal   | John Abbott        |
| 1733 | CoCoALib-0.99880 | Resolved    | FactorINT: funny order  | 22 Apr 2024 19:51 | 60     | Low      | John Abbott        |
| 1582 | CoCoALib-0.99900 | New         | Factorization in $K(a,b)[x,y]$  | 07 Mar 2024 20:23 | 0      | Normal   |                    |
| 785  | CoCoALib-1.0     | New         | finite fields: global register of fields already created?                               | 15 Oct 2015 17:27 | 0      | Normal   |                    |
| 1371 | CoCoALib-1.0     | In Progress | French students' example with GFan  | 27 Nov 2019 15:53 | 10     | Low      |                    |
| 1667 | CoCoALib-0.99880 | In Progress | GBasis over ZZ: port to CoCoALib  | 26 Mar 2024 17:19 | 10     | Urgent   |                    |
| 1757 | CoCoALib-0.99880 | New         | gcd(f,f) is slow  | 16 Feb 2024 09:57 | 0      | Normal   |                    |
| 987  | CoCoALib-1.0     | New         | GCD: add special case if args are monomials   | 28 Nov 2016 22:04 | 0      | Normal   |                    |
| 1359 | CoCoALib-1.0     | New         | gcd: low degree but big coeffs can be slow  | 30 Oct 2019 22:23 | 0      | Normal   |                    |
| 1668 | CoCoALib-0.99880 | New         | Generalize prim   | 31 Jan 2024 22:03 | 0      | Normal   |                    |
| 780  | CoCoALib-1.0     | In Progress | GroebnerFan/ExternalLib-GFan: improve package   | 21 Apr 2017 11:06 | 20     | Normal   | Anna Maria Bigatti |
| 1069 | CoCoALib-1.0     | In Progress | GroebnerFan: ERROR: Matrix must be invertible   | 17 Dec 2018 15:16 | 10     | Normal   |                    |
| 1737 | CoCoALib-0.99880 | In Progress | Homogenization of an ideal with $\mathbb{Z}^1$ -grading                                 | 01 Feb 2024 19:59 | 20     | Normal   | Anna Maria Bigatti |
| 1349 | CoCoALib-0.99880 | In Progress | ideal ctor where given gens are a gbasis  | 16 Feb 2024 09:52 | 10     | Normal   |                    |
| 1267 | CoCoALib-1.0     | In Progress | Ideal equality  | 09 Apr 2019 17:48 | 10     | Normal   |                    |
| 1269 | CoCoALib-1.0     | New         | Ideal Ops: sort-cuts for trivial args?  | 04 Apr 2019 15:07 | 0      | Normal   |                    |
| 1750 | CoCoALib-0.99880 | In Progress | IdealOfPoints: allow duplicate points?  | 08 Mar 2024 18:23 | 20     | Normal   | John Abbott        |
| 1255 | CoCoALib-0.99880 | New         | Ideals with trivial GBasis  | 08 Mar 2023 19:49 | 0      | Normal   |                    |
| 882  | CoCoALib-1.0     | New         | Impl faster multiplication for DUP (dense univariate polys)                             | 09 May 2016 22:10 | 0      | Normal   |                    |
| 1645 | CoCoALib-0.99900 | In Progress | Implement monic0(f) for the case monic(0)?  | 16 Feb 2024 09:38 | 10     | Normal   |                    |
| 1657 | CoCoALib-0.99880 | New         | Improve CertifyNotPower   | 31 Jan 2024 22:03 | 0      | Normal   |                    |
| 1323 | CoCoALib-1.0     | New         | Improve RealRoots: compute sqfr decomp  | 30 Sep 2019 16:14 | 0      | Normal   |                    |
| 1324 | CoCoALib-1.0     | In Progress | Improve RootBound   | 30 Oct 2019 21:44 | 10     | Normal   |                    |
| 967  | CoCoALib-0.99880 | Resolved    | Improve saturate  | 22 Mar 2024 10:18 | 70     | Normal   | Anna Maria Bigatti |
| 1642 | CoCoALib-0.99880 | In Progress | interreduce: make monic if over finite field?   | 16 Feb 2024 20:44 | 20     | Normal   | John Abbott        |

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| 1637 | CoCoALib-0.99900 | New         | Intersection of Ideals: has GBasis?  | 16 Feb 2024 17:25 | 0      | Low       |                    |
| 1683 | CoCoALib-0.99880 | New         | IsIrred in ZZ[x,y]   | 16 Feb 2024 09:39 | 0      | Immediate | John Abbott        |
| 846  | CoCoALib-1.0     | In Progress | IsIrred: correct design?   | 26 Feb 2019 16:32 | 20     | Normal    | John Abbott        |
| 872  | CoCoALib-0.99880 | In Progress | LinSolve for matrices over FFp   | 08 Mar 2024 17:36 | 30     | Urgent    | John Abbott        |
| 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    |                    |
| 1187 | CoCoALib-1.0     | New         | Matrix rank is slow (over QQ)  | 26 Jun 2018 11:29 | 0      | Normal    |                    |
| 1742 | CoCoALib-0.99880 | New         | MinGens could be faster  | 18 May 2023 13:44 | 10     | Normal    | Anna Maria Bigatti |
| 1796 | CoCoALib-0.99880 | New         | myFinalizeGBasis ("Final clean up") should be more flexible                              | 22 Mar 2024 16:19 | 30     | Normal    | Anna Maria Bigatti |
| 896  | CoCoALib-1.0     | In Progress | myIsEqual, myCmp: direct comparisons between RingElem and MachineInt, BigInt and BigRat? | 25 Jun 2018 15:31 | 10     | Normal    |                    |
| 1394 | CoCoALib-0.99880 | Resolved    | Oddly slow GBasis computation (slow final cleanup)                                       | 16 Apr 2024 22:46 | 70     | Low       | Anna Maria Bigatti |
| 688  | CoCoALib-1.0     | New         | PolyAlgebraHom (PolyRingHom) evaluate multivariate polynomials                           | 22 Apr 2015 14:38 | 10     | Normal    |                    |
| 775  | CoCoALib-1.0     | New         | PPMonoid with 1 extra "exponent"?  | 15 Sep 2015 20:18 | 0      | Low       |                    |
| 842  | CoCoALib-1.0     | New         | PPMonoidSparse: comparisons are VERY SLOW  | 15 Feb 2016 13:57 | 0      | Normal    |                    |
| 1337 | CoCoALib-0.99880 | In Progress | PrimaryDecomposition: a interesting/pathological example                                 | 08 Mar 2023 21:13 | 10     | Normal    | Anna Maria Bigatti |
| 1156 | CoCoALib-1.0     | New         | Printing for RingElem  | 08 Jan 2020 23:02 | 0      | Normal    |                    |
| 1059 | CoCoALib-1.0     | New         | Printing ring for ideals (or just for ideals 0 and 1)                                    | 05 May 2017 16:58 | 10     | Normal    |                    |
| 930  | CoCoALib-1.0     | New         | Printing TwinFloat as (rational) coeff without brackets                                  | 24 Sep 2016 21:43 | 0      | Low       |                    |
| 1705 | CoCoALib-0.99880 | In Progress | ProgressReporter: prepare for new loop?  | 21 Mar 2023 05:27 | 80     | Normal    | John Abbott        |
| 1103 | CoCoALib-1.0     | In Progress | Pseudo-zero-dim ideals   | 05 Nov 2021 16:09 | 30     | Normal    | Anna Maria Bigatti |
| 974  | CoCoALib-1.0     | In Progress | QIR/RealRootRefine: improve behaviour if input interval has "nasty" endpoints            | 01 Mar 2021 21:25 | 10     | Normal    |                    |
| 1417 | CoCoALib-0.99880 | In Progress | RadicalZeroDim with extra parameter for GBasis timeout                                   | 16 Mar 2024 21:42 | 20     | Normal    | Anna Maria Bigatti |
| 1369 | CoCoALib-1.0     | In Progress | RandomUnimodularMat is slow with many iters  | 09 Jan 2020 12:19 | 10     | Low       |                    |
| 1685 | CoCoALib-0.99880 | In Progress | RingBase::mySwap needed?   | 07 Mar 2024 20:49 | 10     | Normal    |                    |
| 1370 | CoCoALib-0.99880 | New         | RingID counter increased inside some functions   | 31 Jan 2024 22:19 | 0      | Low       |                    |
| 1643 | CoCoALib-0.99880 | New         | rref slower than expected (maybe) [[reduced row echelon form]]                           | 01 Mar 2024 09:54 | 0      | Normal    |                    |
| 1485 | CoCoALib-0.99880 | New         | Simple syntax for making a quotient ring?  | 08 Mar 2023 19:51 | 0      | Normal    |                    |
| 1706 | CoCoALib-1.0     | New         | slimgb: Brickenstein, singular   | 30 Oct 2022 20:30 | 0      | Normal    |                    |
| 968  | CoCoALib-1.0     | In Progress | Slow NF example  | 10 Nov 2016 21:33 | 10     | Normal    |                    |

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| 777                   | CoCoALib-0.99880 | In Progress | SLUG: elimination  | 22 Mar 2024 18:12 | 10     | Normal   | Anna Maria Bigatti |
| 1118                  | CoCoALib-0.99880 | In Progress | SLUG: factorization of $x^{9999}$  | 31 Jan 2024 22:20 | 10     | Low      |                    |
| 1070                  | CoCoALib-1.0     | New         | Slug: MakeTermOrd (rk calls in RemoveRedundantRows)                        | 17 May 2017 13:47 | 10     | Normal   | Anna Maria Bigatti |
| 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 |
| 1518                  | CoCoALib-0.99900 | In Progress | SLUG: Printing PPs with many indets  | 15 Feb 2024 22:45 | 20     | Normal   |                    |
| 904                   | CoCoALib-1.0     | New         | SmallFpDouble: which impl of InvMod to use?                                | 04 Jul 2016 13:45 | 0      | Normal   |                    |
| 869                   | CoCoALib-1.0     | New         | SmallFpImpl: different repr for computation and for storage?               | 22 Apr 2016 15:14 | 0      | Normal   |                    |
| 797                   | CoCoALib-1.0     | In Progress | SmallFpImpl: make it faster  | 24 Apr 2024 23:04 | 20     | Normal   | John Abbott        |
| 839                   | CoCoALib-1.0     | In Progress | SparsePolyIter: make more compatible with STL                              | 07 Mar 2024 20:01 | 10     | Low      |                    |
| 1130                  | CoCoALib-1.0     | In Progress | SqFreeFactor: should it work over ZZ?                                      | 05 Apr 2019 15:39 | 10     | Normal   |                    |
| 1446                  | CoCoALib-0.99880 | In Progress | Start using C++14 "move" capability  | 08 Mar 2024 18:00 | 10     | Normal   |                    |
| 1492                  | CoCoALib-0.99900 | New         | submat of a submat   | 16 Feb 2024 17:28 | 0      | Low      |                    |
| 1692                  | CoCoALib-0.99900 | In Progress | Suggestion: Add "JumpTo" function to prime iterators                       | 15 Feb 2024 22:39 | 10     | Normal   |                    |
| 1682                  | CoCoALib-0.99900 | In Progress | swap for new classes   | 16 Feb 2024 09:35 | 10     | Normal   |                    |
| 598                   | CoCoALib-0.99880 | In Progress | Syzygy for modules: non-homogeneous module                                 | 27 Mar 2024 17:31 | 40     | Normal   | Anna Maria Bigatti |
| 1802                  | CoCoALib-0.99900 | New         | Tidying ideal generators (for non-polynomial ideals)                       | 25 Mar 2024 19:05 | 0      | Normal   |                    |
| 710                   | CoCoALib-0.99880 | In Progress | Update normaliz interface?   | 16 Feb 2024 18:25 | 10     | Normal   |                    |
| 1793                  | CoCoALib-0.99880 | In Progress | Use ErrorContext instead of string FnName                                  | 26 Mar 2024 11:50 | 60     | Normal   |                    |
| 1572                  | CoCoALib-0.99880 | Resolved    | Use noexcept   | 23 Apr 2024 21:57 | 70     | Normal   | John Abbott        |
| 799                   | CoCoALib-1.0     | In Progress | vector of "indets" in each PPMonoid?                                       | 11 Nov 2015 13:47 | 20     | Low      | John Abbott        |
| 1764                  | CoCoALib-0.99880 | New         | Verbosity messages: avoid printing BIG values                              | 02 Feb 2024 20:34 | 0      | Normal   |                    |
| 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   |                    |
| 970                   | CoCoALib-1.0     | In Progress | Weights in ElimMat?  | 11 Nov 2016 15:49 | 10     | Normal   |                    |
| 329                   | CoCoALib-1.0     | New         | Why is DMPI slower than DMPClean?  | 13 May 2015 09:54 | 0      | Normal   |                    |
| <b>Makefile (2)</b>   |                  |             |  |                   |        |          |                    |
| 149                   | CoCoALib-1.0     | New         | Makefile dependencies  | 01 Aug 2014 08:59 | 0      | Normal   |                    |
| 779                   | CoCoALib-1.0     | New         | Makefile: problem not seeing when files in TmpFactorDir need to be rebuilt | 17 Sep 2015 22:10 | 0      | Low      |                    |
| <b>Maths Bugs (5)</b> |                  |             |  |                   |        |          |                    |
| 1281                  | CoCoALib-0.99880 | New         | Factor of multivariate sometimes prints ERROR                              | 21 Jan 2024 20:03 | 10     | High     |                    |

| #                         | Target version     | Status      | Subject   | Updated           | % Done | Priority | Assignee           |
|---------------------------|--------------------|-------------|---|-------------------|--------|----------|--------------------|
| 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   |                    |
| 1571                      | CoCoALib-0.99880   | New         | ker_H needs care  | 16 Feb 2024 17:49 | 10     | Normal   | Anna Maria Bigatti |
| 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 |
| <b>New Function (105)</b> |                    |             |   |                   |        |          |                    |
| 1207                      | CoCoALib-0.99880   | New         | New function: SubmoduleOfGBasis   | 18 Mar 2024 09:33 | 0      | Normal   |                    |
| 678                       | CoCoALib-1.0       | In Progress | Accumulator (like a geobucket)  | 17 Nov 2016 19:03 | 20     | Normal   |                    |
| 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   |                    |
| 1652                      | CoCoALib-0.99900   | In Progress | Add LM to cocoalib ?  | 15 Feb 2024 22:41 | 10     | Low      |                    |
| 703                       | CoCoALib-1.0       | New         | Add more operations between modules (CoCoALib)                                | 27 Oct 2017 11:53 | 10     | Normal   | Anna Maria Bigatti |
| 399                       | CoCoALib-1.0       | New         | add myHilbertSeries member field to ideal and (sub)module                     | 30 Jul 2014 17:04 | 0      | High     | Anna Maria Bigatti |
| 400                       | CoCoALib-1.0       | New         | add myJMill member field to ideal   | 15 Sep 2014 12:04 | 0      | Normal   |                    |
| 386                       | CoCoALib-1.0       | In Progress | add resolution data type  | 11 Jun 2015 14:58 | 10     | High     | Anna Maria Bigatti |
| 1468                      | CoCoALib-0.99900   | In Progress | Adjoin indets to a poly ring  | 15 Feb 2024 22:45 | 10     | Normal   |                    |
| 1339                      | CoCoALib-1.0       | New         | All PPs of given wdeg   | 16 Oct 2019 14:04 | 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   |                    |
| 246                       | CoCoALib-1.0       | New         | Approx QIR  | 04 Apr 2014 17:16 | 0      | Normal   |                    |
| 129                       | CoCoALib-1.0       | New         | Better GCD  | 09 Jul 2014 18:08 | 0      | Normal   |                    |
| 873                       | CoCoALib-1.0       | In Progress | bool3: add some logical operations?   | 21 Jun 2016 14:37 | 10     | Normal   |                    |
| 143                       | CoCoALib-1.0       | In Progress | Buchberger-Moeller (parent task)  | 10 Jul 2014 14:16 | 38     | Urgent   | John Abbott        |
| 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        |
| 145                       | CoCoALib-1.0       | New         | Buchberger-Moeller: fast modular impl   | 10 Jul 2014 14:17 | 0      | Urgent   | John Abbott        |
| 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   |                    |
| 1132                      | CoCoALib-0.99880   | New         | Canonical homomorphism for (some) polynomial rings?                           | 08 Mar 2024 18:01 | 0      | Normal   | Anna Maria Bigatti |
| 1001                      | removed/duplicates | In Progress | CoCoALib: ideas for student projects  | 18 Feb 2022 16:57 | 10     | Normal   |                    |
| 628                       | CoCoALib-1.0       | New         | Complex twin-floats   | 22 Sep 2014 18:16 | 0      | Normal   |                    |
| 134                       | CoCoALib-1.0       | New         | Convenience ring ctors and homs   | 11 Jul 2014 12:06 | 0      | Normal   |                    |

| #    | Target version   | Status      | Subject  | Updated           | % Done | Priority | Assignee           |
|------|------------------|-------------|--|-------------------|--------|----------|--------------------|
| 1532 | CoCoALib-0.99900 | In Progress | Convenient RingHom pseudo-ctors  | 07 Mar 2024 21:34 | 10     | Normal   |                    |
| 127  | CoCoALib-1.0     | In Progress | Convert DUPFF code to C++  | 28 Sep 2022 15:04 | 50     | Normal   | John Abbott        |
| 838  | CoCoALib-1.0     | In Progress | Differential algebra   | 24 Oct 2016 15:32 | 10     | Normal   |                    |
| 802  | CoCoALib-0.99880 | In Progress | DivMask: extend interface?   | 08 Mar 2024 17:36 | 50     | Urgent   | John Abbott        |
| 442  | CoCoALib-1.0     | New         | Eigenvectors   | 09 Jul 2014 18:05 | 0      | Normal   |                    |
| 313  | CoCoALib-0.99880 | In Progress | Elim(vector<long>) as PPOrderingCtor                                   | 22 Mar 2024 18:17 | 30     | High     | Anna Maria Bigatti |
| 1306 | CoCoALib-0.99880 | In Progress | exgcd over integers (ZZ)   | 08 Mar 2024 17:57 | 20     | Normal   |                    |
| 1227 | CoCoALib-1.0     | New         | exgcd; solve Bezout equation   | 29 Aug 2019 14:55 | 0      | Normal   |                    |
| 738  | CoCoALib-1.0     | In Progress | Extend homomorphism to polynomial ring                                 | 25 Jun 2015 17:23 | 10     | Normal   |                    |
| 1482 | CoCoALib-0.99900 | In Progress | Extended rationals: PlusInfinity and MinusInfinity                     | 16 Feb 2024 18:02 | 10     | Normal   |                    |
| 667  | CoCoALib-1.0     | New         | factor: multivariate + finite characteristic                           | 04 Mar 2015 20:08 | 0      | Normal   |                    |
| 690  | CoCoALib-1.0     | New         | Fault tolerant rational reconstruction: implement simultaneous version | 23 Apr 2015 19:12 | 0      | Normal   |                    |
| 1437 | CoCoALib-0.99900 | New         | Filling matrix row/col from a vector                                   | 15 Feb 2024 22:46 | 0      | Normal   |                    |
| 565  | CoCoALib-1.0     | In Progress | FloatApprox for TwinFloat values?                                      | 19 Jul 2016 22:44 | 20     | Normal   | John Abbott        |
| 515  | CoCoALib-1.0     | New         | Fn to "flatten" multiple polynomial extns                              | 10 Jul 2014 14:22 | 0      | Normal   |                    |
| 923  | CoCoALib-1.0     | New         | Fn to read symbol range (SymbolRange)                                  | 16 Sep 2016 15:04 | 0      | Normal   |                    |
| 539  | CoCoALib-1.0     | New         | Functions to clean up a factorization                                  | 22 Jan 2024 20:28 | 0      | Low      |                    |
| 627  | CoCoALib-1.0     | New         | Gaussian integer and rationals ZZi, QQi                                | 23 Sep 2014 16:30 | 0      | Normal   |                    |
| 229  | CoCoALib-1.0     | New         | Generator for random ring elements                                     | 01 Aug 2014 08:59 | 0      | Normal   |                    |
| 817  | CoCoALib-1.0     | New         | GenRepr in CoCoALib?   | 17 Nov 2016 14:12 | 0      | High     |                    |
| 1470 | CoCoALib-0.99900 | New         | Get indexed indets from a polyring                                     | 07 Mar 2024 20:36 | 0      | Normal   |                    |
| 1441 | CoCoALib-0.99900 | New         | GFan: port CoCoA_5 functions into CoCoALib                             | 16 Feb 2024 17:54 | 0      | Normal   | Anna Maria Bigatti |
| 840  | CoCoALib-1.0     | In Progress | GINV: alex basis   | 31 Mar 2016 13:05 | 10     | Normal   |                    |
| 227  | CoCoALib-1.0     | New         | HilbertBasis from Normaliz: full-lattice or not?                       | 31 Jul 2014 12:39 | 0      | Normal   |                    |
| 1433 | CoCoALib-0.99900 | New         | HilbertDriven Buchberger Algorithm                                     | 16 Feb 2024 18:02 | 0      | Normal   | Anna Maria Bigatti |
| 1444 | CoCoALib-0.99880 | New         | HNF: Hermite Normal Form   | 16 Feb 2024 09:53 | 0      | Normal   |                    |
| 1778 | CoCoALib-0.99880 | In Progress | Homogenizer  | 08 Feb 2024 22:08 | 10     | Normal   |                    |
| 1472 | CoCoALib-0.99900 | In Progress | Idea for for loops   | 16 Feb 2024 09:55 | 10     | Low      |                    |
| 123  | CoCoALib-1.0     | New         | IdealOfPoints with generic coeffs                                      | 09 Jul 2014 18:15 | 0      | Normal   |                    |
| 664  | CoCoALib-0.99880 | Resolved    | Impl small non-prime finite fields (using logs)                        | 14 Mar 2023 19:49 | 80     | Urgent   | John Abbott        |

| #    | Target version   | Status      | Subject   | Updated           | % Done | Priority  | Assignee           |
|------|------------------|-------------|---|-------------------|--------|-----------|--------------------|
| 813  | CoCoALib-0.99880 | Feedback    | Implement "elim" in CoCoALib  | 18 Mar 2024 15:58 | 90     | Immediate | Anna Maria Bigatti |
| 387  | CoCoALib-1.0     | New         | implement algorithm(s) for resolutions  | 30 Jul 2014 17:04 | 0      | High      | Anna Maria Bigatti |
| 589  | CoCoALib-1.0     | New         | Implement gin (generic initial ideal) in cocoalib   | 15 Jul 2014 18:17 | 0      | Normal    | Anna Maria Bigatti |
| 1743 | CoCoALib-0.99880 | New         | Implement Truncated GBases for homogeneous input  | 19 May 2023 15:42 | 0      | Normal    | Anna Maria Bigatti |
| 436  | CoCoALib-1.0     | New         | Improve UPoly eval at BigRat for binary rational  | 01 Aug 2014 08:59 | 0      | Normal    |                    |
| 665  | CoCoALib-1.0     | In Progress | Integrate Janet/Pommaret basis code   | 12 Jun 2018 18:36 | 10     | Normal    | John Abbott        |
| 1176 | CoCoALib-0.99880 | In Progress | interval arithmetic   | 10 Mar 2023 17:46 | 50     | Normal    | John Abbott        |
| 113  | CoCoALib-1.0     | In Progress | Introduce PartialHom  | 09 Jul 2014 18:04 | 10     | Normal    | John Abbott        |
| 885  | CoCoALib-1.0     | In Progress | IsIrred3: fast 3-way irred test (returning bool3)   | 30 Apr 2019 17:19 | 10     | Normal    |                    |
| 947  | CoCoALib-0.99880 | In Progress | IsRadical for ideal?  | 23 Jan 2024 22:13 | 10     | Normal    |                    |
| 174  | CoCoALib-1.0     | New         | IsStdGraded: add for PPOrdering, PPMonoid, (Sparse)PolyRing..                                     | 01 Aug 2014 08:59 | 0      | Normal    |                    |
| 1197 | CoCoALib-0.99880 | In Progress | IsZeroDet: new fn   | 08 Mar 2024 17:58 | 40     | Normal    | John Abbott        |
| 151  | CoCoALib-1.0     | New         | Iterated CanonicalHom   | 13 May 2015 09:58 | 0      | Normal    |                    |
| 661  | CoCoALib-1.0     | New         | Laurent polynomials   | 23 Jan 2015 13:50 | 0      | Normal    |                    |
| 937  | CoCoALib-1.0     | In Progress | LinDepMill: Mill for linear dependencies  | 18 Apr 2024 16:38 | 10     | Normal    | Anna Maria Bigatti |
| 459  | CoCoALib-1.0     | New         | LinearSimplify: port to CoCoALib  | 20 May 2014 09:47 | 0      | Low       |                    |
| 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        |
| 206  | CoCoALib-0.99880 | In Progress | Matrix equation solving: LinKer   | 22 Mar 2024 09:42 | 30     | Urgent    |                    |
| 125  | CoCoALib-0.99880 | In Progress | Matrix equation solving; linear system solving  | 18 Mar 2024 10:00 | 50     | Normal    | John Abbott        |
| 409  | CoCoALib-1.0     | New         | Minimal syzygies (optimized implementation)   | 31 Jul 2014 12:36 | 0      | High      | Anna Maria Bigatti |
| 337  | CoCoALib-1.0     | New         | Module homs   | 31 Jul 2014 12:40 | 0      | Normal    |                    |
| 297  | CoCoALib-1.0     | In Progress | Modules design: brainstorming   | 31 Jul 2014 14:55 | 30     | Normal    |                    |
| 583  | CoCoALib-1.0     | New         | New function for printing with extra information  | 07 Jul 2014 11:48 | 0      | Normal    |                    |
| 1022 | CoCoALib-1.0     | New         | New "LF" function which is based on StdDeg  | 06 Mar 2017 19:37 | 20     | Normal    |                    |
| 1808 | CoCoALib-0.99880 | In Progress | New constructor for PolyRing with elimination ordering  | 28 Mar 2024 07:35 | 10     | Normal    | Anna Maria Bigatti |
| 1150 | CoCoALib-1.0     | New         | New fn: transform ideal with ring hom   | 22 Jun 2020 10:34 | 0      | Normal    |                    |
| 898  | CoCoALib-0.99880 | In Progress | New function: cardinality of finite field?  | 08 Mar 2024 17:45 | 20     | High      | Anna Maria Bigatti |

| #                       | Target version   | Status      | Subject  | Updated           | % Done | Priority | Assignee           |
|-------------------------|------------------|-------------|--|-------------------|--------|----------|--------------------|
| 949                     | CoCoALib-0.99900 | New         | New function: IdealWithIncrementalGBasis(l, f)                                   | 16 Feb 2024 18:03 | 0      | Normal   | Anna Maria Bigatti |
| 1254                    | CoCoALib-0.99880 | New         | New function: MinPoly for pseudo-zero-dimensional ideals                         | 07 Mar 2024 20:25 | 0      | Normal   | Anna Maria Bigatti |
| 958                     | CoCoALib-0.99880 | Resolved    | New function: multiplicity and dim   | 08 Mar 2024 18:15 | 80     | Normal   | Anna Maria Bigatti |
| 914                     | CoCoALib-1.0     | New         | New function: quorem for univariate polynomials?                                 | 22 Aug 2016 16:45 | 0      | Normal   |                    |
| 1198                    | CoCoALib-1.0     | New         | Non-standard DegRevLex (NonStdDegRevLex, WDegRevLex)                             | 23 Sep 2019 12:44 | 0      | Normal   |                    |
| 728                     | CoCoALib-1.0     | In Progress | Noncommutative algebra "of solvable type"  | 09 Jul 2015 08:39 | 10     | Normal   |                    |
| 1635                    | CoCoALib-0.99880 | In Progress | NR for polys with coeffs in PID  | 16 Feb 2024 09:39 | 10     | Normal   |                    |
| 651                     | CoCoALib-1.0     | In Progress | Optimized algorithms for implicitization (slicing algorithm, elim, subalgebra..) | 12 Feb 2015 10:33 | 10     | Normal   |                    |
| 992                     | CoCoALib-1.0     | New         | Poly ring homomorphism to change ordering  | 13 Dec 2016 18:04 | 0      | Normal   |                    |
| 1278                    | CoCoALib-1.0     | New         | Port old "clever" code for matrix determinant over ZZ to CoCoALib                | 03 May 2019 11:42 | 0      | Normal   |                    |
| 440                     | CoCoALib-1.0     | New         | Port RealRoots to C++  | 19 Oct 2016 10:26 | 0      | High     | John Abbott        |
| 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   |                    |
| 289                     | CoCoALib-1.0     | New         | PrimeField -- new fn?  | 01 Aug 2014 08:59 | 0      | Normal   |                    |
| 1715                    | CoCoALib-0.99880 | New         | ProductBigInt (also ProductBigRat???)  | 23 Jan 2024 22:14 | 0      | Low      |                    |
| 513                     | CoCoALib-1.0     | In Progress | Quick/correct flag for bool3 fns   | 10 Jul 2014 16:30 | 10     | High     |                    |
| 913                     | CoCoALib-1.0     | New         | Read input from SymbolicData database  | 02 Aug 2016 10:55 | 0      | Normal   | Anna Maria Bigatti |
| 620                     | CoCoALib-1.0     | In Progress | Redesign CRTMill   | 21 Mar 2016 14:30 | 20     | Normal   | John Abbott        |
| 383                     | CoCoALib-1.0     | In Progress | Resolution/morse: integrate Mario Albert's code into CoCoALib                    | 31 Jul 2014 14:57 | 60     | Normal   | John Abbott        |
| 1094                    | CoCoALib-0.99880 | In Progress | Revive code for SelfSaturating GBasis  | 22 Mar 2024 14:38 | 50     | Normal   | Anna Maria Bigatti |
| 1602                    | CoCoALib-0.99900 | New         | Sparse matrix (SparseMat)  | 15 Feb 2024 22:42 | 0      | Low      |                    |
| 1282                    | CoCoALib-0.99900 | New         | subresultant   | 08 Mar 2024 17:54 | 20     | Normal   |                    |
| 801                     | CoCoALib-0.99880 | New         | Test whether a symbol is in a ring   | 07 Mar 2024 21:36 | 0      | Normal   |                    |
| 1173                    | CoCoALib-1.0     | New         | Upper bound for value of poly in an interval                                     | 04 Apr 2018 11:55 | 0      | Normal   |                    |
| <b>Portability (17)</b> |                  |             |  |                   |        |          |                    |
| 1670                    | CoCoALib-0.99880 | New         | Build also dynamic/shared library for CoCoALib?                                  | 07 Mar 2024 21:33 | 0      | Normal   |                    |
| 326                     | CoCoALib-1.0     | In Progress | C++ nasty surprises  | 07 Apr 2014 18:13 | 10     | Normal   |                    |
| 1010                    | CoCoALib-1.0     | New         | C++11: Mario's Hilbert scheme code   | 20 Feb 2017 13:19 | 0      | Urgent   |                    |
| 1632                    | CoCoALib-1.0     | New         | C++17: notes about updating  | 12 Nov 2021 18:11 | 0      | Normal   |                    |

| #    | Target version   | Status      | Subject   | Updated           | % Done | Priority | Assignee           |
|------|------------------|-------------|---|-------------------|--------|----------|--------------------|
| 302  | CoCoALib-1.0     | In Progress | Compilation on M\$Windows: Visual Studio                                      | 22 Mar 2024 23:13 | 60     | Normal   |                    |
| 617  | CoCoALib-1.0     | New         | configure: check all libraries for compatibility                              | 09 Sep 2014 12:21 | 0      | Normal   |                    |
| 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        |
| 575  | CoCoALib-1.0     | In Progress | Investigate using cmake for configuration                                     | 13 Mar 2024 21:19 | 10     | Normal   | John Abbott        |
| 1225 | CoCoALib-0.99900 | In Progress | Move to C++14 (skipping C++11)  | 08 Mar 2024 17:46 | 30     | High     |                    |
| 591  | CoCoALib-1.0     | In Progress | Problem with template instantiation and order of include directives           | 09 Feb 2024 10:18 | 50     | Low      |                    |
| 933  | CoCoALib-0.99880 | In Progress | Separate configure scripts for CoCoALib and CoCoA-5                           | 23 Jan 2024 21:52 | 10     | Normal   | John Abbott        |
| 1699 | CoCoALib-0.99880 | In Progress | Shell scripts: Shebang line, etc  | 16 Feb 2024 10:01 | 10     | Normal   |                    |
| 1630 | CoCoALib-0.99900 | New         | Signal handler not portable?  | 15 Feb 2024 22:42 | 0      | Normal   |                    |
| 1804 | CoCoALib-0.99900 | In Progress | Use long long (at least sometimes)?   | 23 Apr 2024 22:05 | 80     | Normal   | John Abbott        |

### Renaming (6)

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

### Safety (25)

|      |                  |             |   |                   |    |        |                    |
|------|------------------|-------------|---|-------------------|----|--------|--------------------|
| 1208 | CoCoALib-1.0     | New         | New function: Threadsafe RandomLinearForm (CoCoALib)      | 01 Oct 2019 11:28 | 0  | Normal |                    |
| 497  | CoCoALib-1.0     | New         | Clang: automatic bug finding                              | 04 Apr 2014 17:20 | 0  | 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 |
| 1814 | CoCoALib-0.99900 | In Progress | Ensure tests do not need too much RAM                     | 23 Apr 2024 22:14 | 30 | Normal |                    |
| 986  | CoCoALib-1.0     | In Progress | GFan: require version newer than 0.6                      | 22 Apr 2024 20:06 | 10 | Low    |                    |
| 1388 | CoCoALib-0.99880 | New         | GlobalManager: create SignalWatcher internally?           | 01 Mar 2024 09:49 | 0  | Normal |                    |
| 142  | CoCoALib-0.99880 | In Progress | Improve threadsafety                                      | 21 Mar 2024 20:29 | 50 | Normal |                    |
| 925  | CoCoALib-0.99880 | In Progress | MachineInt or long for args which are indices (yet again) | 16 Apr 2024 22:29 | 50 | Normal |                    |
| 934  | CoCoALib-0.99880 | In Progress | MachineInt: change semantics?                             | 22 Apr 2024 21:32 | 30 | Normal |                    |

| #                   | Target version   | Status      | Subject  | Updated           | % Done | Priority | Assignee           |
|---------------------|------------------|-------------|--|-------------------|--------|----------|--------------------|
| 835                 | CoCoALib-1.0     | New         | Make Mario's new code threadsafe   | 09 Dec 2015 16:48 | 0      | Normal   |                    |
| 707                 | CoCoALib-0.99880 | In Progress | MatrixOrderingMod32749Impl: test and write documentation!                | 08 Mar 2024 18:15 | 10     | 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      |                    |
| 1691                | CoCoALib-0.99900 | New         | Random and threadsafe?   | 15 Feb 2024 22:38 | 0      | Normal   |                    |
| 551                 | CoCoALib-1.0     | New         | Reconsider overloaded virtual mem fns                                    | 09 Jul 2014 18:00 | 0      | Normal   |                    |
| 787                 | CoCoALib-1.0     | New         | Remove refcounts from RingElem?  | 19 Oct 2015 17:08 | 0      | Normal   |                    |
| 639                 | CoCoALib-1.0     | New         | Shadow CoCoA namespace to help guarantee portability (without ambiguity) | 28 Oct 2014 15:34 | 0      | Low      |                    |
| 1813                | CoCoALib-0.99900 | In Progress | Some tests have become slower  | 07 Apr 2024 21:53 | 10     | Normal   |                    |
| 894                 | CoCoALib-0.99880 | In Progress | strict enum types: C++11 extension                                       | 16 Mar 2024 21:38 | 30     | Normal   | John Abbott        |
| 562                 | CoCoALib-1.0     | New         | Subrings   | 29 Sep 2020 13:19 | 0      | Normal   |                    |
| 1703                | CoCoALib-0.99880 | Resolved    | Threadsafty, multithreading: optional fn arg (or separate fn)            | 07 Mar 2024 20:04 | 80     | Normal   | John Abbott        |
| 784                 | CoCoALib-1.0     | In Progress | threadsafty: Scott Meyers's advice about cached values                   | 18 Jan 2016 18:12 | 10     | Normal   |                    |
| 647                 | CoCoALib-1.0     | New         | Unique copies of free modules?   | 10 Nov 2014 16:55 | 0      | Normal   |                    |
| 482                 | CoCoALib-1.0     | In Progress | Unique copies of rings -- smart ctor                                     | 20 Oct 2015 14:33 | 10     | Normal   |                    |
| 1678                | CoCoALib-0.99880 | In Progress | Unsigned long for indexes (& sizes?)                                     | 07 Mar 2024 20:25 | 10     | Normal   |                    |
| <b>Tidying (62)</b> |                  |             |  |                   |        |          |                    |
| 808                 | CoCoALib-1.0     | New         | Alg Extn by non-zero dim ideal   | 18 Nov 2015 23:29 | 0      | Normal   |                    |
| 1801                | CoCoALib-0.99880 | In Progress | BuildInfo  | 13 Apr 2024 22:18 | 10     | Normal   |                    |
| 1242                | CoCoALib-0.99880 | In Progress | C++14: Use type auto where appropriate                                   | 22 Apr 2024 21:08 | 40     | Normal   |                    |
| 1811                | CoCoALib-0.99880 | Feedback    | Check include guards   | 22 Apr 2024 20:15 | 90     | Normal   | John Abbott        |
| 791                 | CoCoALib-1.0     | New         | Clean code for DistrMPolyClean   | 02 Nov 2015 22:13 | 0      | Normal   | Anna Maria Bigatti |
| 1799                | CoCoALib-1.0     | New         | Clean out OLD CODE?  | 24 Mar 2024 10:52 | 0      | Normal   |                    |
| 1609                | CoCoALib-0.99880 | New         | Clean time.C   | 08 Mar 2023 19:54 | 0      | Low      |                    |
| 1736                | CoCoALib-0.99880 | New         | Clean TmpGOperations, and remove Tmp prefix                              | 28 Apr 2023 16:01 | 0      | Normal   |                    |
| 1160                | CoCoALib-1.0     | New         | Clean up revised RatReconstructByContFrac code                           | 26 Feb 2019 16:33 | 0      | Normal   | John Abbott        |
| 1179                | CoCoALib-0.99880 | In Progress | Clean up SparsePolyOps-MonomialIdeals                                    | 22 Mar 2024 09:33 | 20     | Normal   | Anna Maria Bigatti |
| 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 |
| 849                 | CoCoALib-0.99880 | In Progress | Cleanup MinPoly code   | 08 Mar 2024 18:15 | 10     | Normal   | Anna Maria Bigatti |
| 1783                | CoCoALib-0.99900 | In Progress | Code & doc structure: one-big-file or many-small-files?                  | 24 Feb 2024 18:34 | 10     | Normal   |                    |

| #    | Target version   | Status      | Subject   | Updated           | % Done | Priority | Assignee           |
|------|------------------|-------------|---|-------------------|--------|----------|--------------------|
| 1800 | CoCoALib-0.99880 | In Progress | Conversion from SmallPrime to UNSIGNED long?                            | 15 Apr 2024 10:09 | 10     | Normal   |                    |
| 1792 | CoCoALib-0.99880 | New         | CpuTimeOut: arg of type ErrorContext?                                   | 18 Mar 2024 20:50 | 0      | Normal   |                    |
| 1213 | CoCoALib-0.99900 | New         | Create PolyOps-RingElem?  | 16 Feb 2024 09:48 | 0      | Normal   |                    |
| 778  | CoCoALib-1.0     | In Progress | CRTMill::myAddInfo accept modulus 1 or not?                             | 21 Mar 2016 15:16 | 0      | Normal   |                    |
| 1727 | CoCoALib-0.99880 | New         | Cruft in ExtLibs-Normaliz.C   | 13 Mar 2023 19:01 | 0      | Normal   |                    |
| 1098 | CoCoALib-1.0     | New         | Ctors for exceptions/errors   | 06 Sep 2017 15:27 | 0      | Normal   |                    |
| 1428 | CoCoALib-0.99880 | New         | DenseMatrix: use template impl for ctors from vec-vec?                  | 07 Mar 2024 20:49 | 0      | Normal   |                    |
| 385  | CoCoALib-0.99900 | In Progress | Design new errors using inheritance                                     | 09 Feb 2024 10:25 | 40     | Urgent   | John Abbott        |
| 680  | CoCoALib-0.99880 | Resolved    | DistrMPolyClean does not use MemPool for summands?                      | 07 Mar 2023 20:49 | 70     | Normal   | John Abbott        |
| 1720 | CoCoALib-0.99880 | New         | DivAlg in CoCoALib  | 25 Mar 2024 17:55 | 20     | Normal   | Anna Maria Bigatti |
| 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   |                    |
| 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 |
| 537  | CoCoALib-1.0     | New         | FloatStr uses too much memory   | 16 Apr 2014 12:01 | 0      | Low      |                    |
| 272  | CoCoALib-1.0     | New         | Forward declarations  | 07 Apr 2014 18:14 | 0      | Normal   |                    |
| 305  | CoCoALib-1.0     | In Progress | FreeModule: unique copy?  | 10 Dec 2023 20:43 | 10     | Normal   |                    |
| 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   |                    |
| 866  | CoCoALib-0.99880 | In Progress | implicit, ImplicitHypersurface: improve output verification             | 22 Mar 2024 09:43 | 20     | 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        |
| 601  | CoCoALib-0.99880 | In Progress | LongRange: in which file should it be declared/defined?                 | 08 Mar 2023 20:45 | 10     | Normal   |                    |
| 1666 | CoCoALib-0.99900 | In Progress | MachineInt: chase through ULL changes                                   | 16 Apr 2024 22:40 | 10     | Normal   |                    |
| 1782 | CoCoALib-0.99880 | New         | Make CoCoALib test file for radical                                     | 01 Mar 2024 09:44 | 0      | Normal   | Anna Maria Bigatti |
| 516  | CoCoALib-1.0     | New         | Make squarefreefactor work in multiple polynomial extns                 | 10 Jul 2014 14:21 | 0      | Normal   |                    |
| 675  | CoCoALib-1.0     | In Progress | Matrix determinant over multivariate poly ring                          | 22 May 2015 13:45 | 10     | Normal   |                    |
| 1562 | CoCoALib-0.99880 | New         | matrix.H and MatrixView.H   | 08 Mar 2023 19:56 | 0      | Normal   |                    |
| 437  | CoCoALib-1.0     | In Progress | MemPool: order free blocks?   | 13 Apr 2015 23:31 | 10     | Normal   |                    |
| 263  | CoCoALib-1.0     | New         | Move the various <matrix>::mySetEntry procedures into MatrixBase        | 01 Aug 2014 16:29 | 0      | High     |                    |
| 1465 | CoCoALib-0.99880 | In Progress | mul(MAT,MAT,MAT)  | 16 Feb 2024 10:04 | 10     | Normal   |                    |
| 686  | CoCoALib-1.0     | New         | myAddMul in poly rings  | 20 Apr 2015 13:22 | 20     | Normal   | Anna Maria Bigatti |

| #                   | Target version   | Status      | Subject  | Updated           | % Done | Priority | Assignee           |
|---------------------|------------------|-------------|--|-------------------|--------|----------|--------------------|
| 1147                | CoCoALib-1.0     | New         | mySquare and myPowerSmallExp   | 30 Apr 2019 17:18 | 0      | Normal   |                    |
| 841                 | CoCoALib-1.0     | In Progress | NewPolyRing: tidy up the many different versions                         | 01 Sep 2017 11:30 | 10     | Normal   |                    |
| 1677                | CoCoALib-0.99880 | In Progress | release-source script: use shell globbing?                               | 16 Feb 2024 10:01 | 10     | Normal   |                    |
| 695                 | CoCoALib-1.0     | New         | Remove cruft from test files   | 08 May 2015 11:37 | 0      | Normal   |                    |
| 1669                | CoCoALib-0.99880 | New         | Review File subtree hierarchy  | 08 Mar 2023 19:56 | 0      | Normal   |                    |
| 1014                | CoCoALib-1.0     | In Progress | RowMat, ColMat with arg an empty list/vector                             | 24 Feb 2017 17:54 | 10     | Low      |                    |
| 1125                | CoCoALib-0.99880 | New         | Separate install script for CoCoALib?                                    | 23 Jan 2024 21:54 | 0      | Normal   | John Abbott        |
| 572                 | CoCoALib-1.0     | New         | Split SparsePolyRing.H into two files? Problem with circular includes.   | 17 May 2018 16:36 | 0      | Normal   |                    |
| 316                 | CoCoALib-1.0     | In Progress | submodule constructor different from ideal                               | 10 Jul 2014 16:21 | 0      | 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 |
| 1263                | CoCoALib-0.99880 | Resolved    | Tidy CoCoALib test directory   | 07 Mar 2023 20:49 | 80     | Normal   | John Abbott        |
| 1355                | CoCoALib-0.99880 | New         | TmpLDP uses srand and time   | 01 Mar 2024 09:50 | 0      | Normal   |                    |
| 833                 | CoCoALib-1.0     | New         | UIBC: need include file in RingWeyl.C                                    | 08 Dec 2015 15:06 | 0      | Low      |                    |
| 1491                | CoCoALib-1.0     | New         | Unified Gaussian reduction impl  | 08 Mar 2023 19:55 | 0      | Normal   |                    |
| 1628                | CoCoALib-0.99880 | In Progress | Unused variables, params, data members                                   | 11 Mar 2023 12:29 | 10     | Normal   |                    |
| 1702                | CoCoALib-0.99900 | In Progress | Use C++ attributes   | 22 Apr 2024 21:26 | 10     | Low      |                    |
| 685                 | CoCoALib-1.0     | New         | Use DivMask inside QBGenerator   | 02 Feb 2016 14:16 | 0      | High     |                    |
| 640                 | CoCoALib-1.0     | New         | What is test-Dynamic1.C  | 29 Oct 2014 11:30 | 0      | Normal   |                    |
| 1464                | CoCoALib-0.99880 | New         | What is the difference between InterruptReceived and InterruptedBySignal | 01 Mar 2024 09:54 | 0      | Normal   |                    |
| <b>Various (25)</b> |                  |             |  |                   |        |          |                    |
| 360                 | CoCoALib-1.0     | New         | CoCoAServer: what future, what issues?                                   | 28 Apr 2017 11:19 | 0      | Normal   |                    |
| 1711                | CoCoALib-0.99880 | Feedback    | Development releases?  | 09 Mar 2023 20:56 | 90     | Normal   | Anna Maria Bigatti |
| 547                 | CoCoALib-1.0     | New         | elim using RingTwinFloat triggers error "SERIOUS"                        | 15 Jun 2016 14:35 | 0      | Normal   |                    |
| 92                  | CoCoALib-1.0     | In Progress | Error Codes  | 19 Apr 2017 08:31 | 0      | Normal   |                    |
| 725                 | CoCoALib-1.0     | New         | Example database: Slow ideal equality test                               | 10 Jun 2015 14:24 | 0      | Normal   |                    |
| 1542                | CoCoALib-0.99880 | In Progress | gfan does not "deinitialize"   | 08 Mar 2023 19:53 | 30     | Normal   |                    |
| 1049                | CoCoALib-1.0     | In Progress | GroebnerFan: slow examples   | 11 Mar 2024 11:12 | 10     | Low      |                    |
| 1089                | CoCoALib-1.0     | In Progress | invalid pointer in "free"  | 20 Jul 2017 13:06 | 10     | Normal   | John Abbott        |
| 1748                | CoCoALib-0.99880 | New         | July 2023  | 08 Mar 2024 08:29 | 0      | Normal   | John Abbott        |
| 120                 | CoCoALib-1.0     | New         | LT over QQ: surprisingly slow  | 10 Jul 2014 16:26 | 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           |
|------|------------------|-------------|---|-------------------|--------|----------|--------------------|
| 401  | CoCoALib-1.0     | New         | NewFreeModule of dimension 0                                    | 31 Jul 2014 14:13 | 0      | Normal   |                    |
| 232  | CoCoALib-1.0     | New         | No test for QBGenerator   | 15 Apr 2015 20:15 | 0      | Normal   |                    |
| 262  | CoCoALib-0.99880 | New         | Play with GIT   | 08 Mar 2023 19:54 | 0      | Normal   |                    |
| 438  | CoCoALib-1.0     | In Progress | Polynomial multiplication (product of RingElem)                 | 10 Jul 2014 16:28 | 10     | Normal   |                    |
| 74   | CoCoALib-1.0     | New         | printing polynomials  | 14 Jul 2014 11:07 | 10     | Normal   |                    |
| 222  | CoCoALib-0.99880 | In Progress | Printing polynomials - spaces between terms                     | 14 Mar 2023 21:27 | 30     | Normal   |                    |
| 746  | CoCoALib-1.0     | New         | Problem with GBasis in tower of alg extns                       | 21 Mar 2016 14:29 | 0      | Normal   |                    |
| 1687 | CoCoALib-0.99850 | In Progress | Release CoCoALib 0.99850  | 29 Mar 2024 10:42 | 50     | Normal   | Anna Maria Bigatti |
| 1810 | CoCoALib-0.99900 | New         | Release CoCoALib 0.99900  | 29 Mar 2024 09:00 | 0      | Normal   |                    |
| 432  | CoCoALib-1.0     | In Progress | Semantics of IsPrintedWithMinus                                 | 14 Jul 2014 18:13 | 10     | Normal   |                    |
| 564  | CoCoALib-1.0     | New         | Temporary file for experimentation                              | 16 Jul 2014 14:38 | 0      | Normal   |                    |
| 1521 | CoCoALib-0.99880 | New         | Unexpectedly slow example with larger types for SmallExponent_t | 08 Mar 2023 19:54 | 0      | Normal   |                    |
| 1777 | CoCoALib-0.99880 | New         | VerificationLevel: just 3? Low, high, guaranteed?               | 16 Feb 2024 10:00 | 0      | Normal   |                    |
| 455  | CoCoALib-1.0     | New         | Which sets of generators in an ideal?                           | 14 Jul 2014 15:17 | 0      | Normal   |                    |