

## CoCoALib - Issues

| #    | Project  | Parent task | Priority | Subject   | Assignee           | Updated           | Category     | % Done |
|------|----------|-------------|----------|---|--------------------|-------------------|--------------|--------|
| 1808 | CoCoALib |             | Normal   | New constructor for PolyRing with elimination ordering                  | Anna Maria Bigatti | 28 Mar 2024 07:35 | New Function | 10     |
| 1797 | CoCoALib |             | Normal   | Add a function CleanupGens making some easy cleaning on the generators? |                    | 25 Mar 2024 19:16 | New Function | 0      |
| 1788 | CoCoALib |             | Normal   | New MatrixView/function "FirstRows/FirstCols"?                          | Anna Maria Bigatti | 20 Mar 2024 15:53 | New Function | 100    |
| 1785 | CoCoALib |             | Normal   | Add function IsHomog3(l)?   |                    | 01 Mar 2024 14:53 | New Function | 0      |
| 1780 | CoCoALib |             | Normal   | radical for ideals in SparsePolyRing: code in C++                       | Anna Maria Bigatti | 22 Mar 2024 09:13 | New Function | 100    |
| 1778 | CoCoALib |             | Normal   | Homogenizer   |                    | 25 Apr 2024 21:54 | New Function | 10     |
| 1770 | CoCoALib |             | Normal   | Evaluate polynomial function/class                                      | John Abbott        | 16 Mar 2024 21:52 | New Function | 100    |
| 1763 | CoCoALib |             | Normal   | implement ideal(R) for zero ideal, with no generators?                  | Anna Maria Bigatti | 16 Feb 2024 18:01 | New Function | 100    |
| 1743 | CoCoALib |             | Normal   | Implement Truncated GBases for homogeneous input                        | Anna Maria Bigatti | 19 May 2023 15:42 | New Function | 0      |
| 1723 | CoCoALib |             | Normal   | New fn CoprimePart, OddPart: naming question                            | John Abbott        | 07 Mar 2023 20:27 | New Function | 100    |
| 1715 | CoCoALib |             | Low      | ProductBigInt (also ProductBigRat???)                                   |                    | 23 Jan 2024 22:14 | New Function | 0      |
| 1694 | CoCoALib |             | Normal   | New expv/exponents function?  | John Abbott        | 09 Mar 2023 21:48 | New Function | 100    |
| 1684 | CoCoALib |             | Normal   | RandomNBitPrime - new fn  | John Abbott        | 08 Aug 2022 20:08 | New Function | 100    |
| 1652 | CoCoALib |             | Low      | Add LM to cocoalib ?  |                    | 15 Feb 2024 22:41 | New Function | 10     |
| 1635 | CoCoALib |             | Normal   | NR for polys with coeffs in PID   |                    | 16 Feb 2024 09:39 | New Function | 10     |
| 1619 | CoCoALib |             | Normal   | Make saturate available in CoCoALib                                     | Anna Maria Bigatti | 22 Mar 2024 10:14 | New Function | 100    |
| 1602 | CoCoALib |             | Low      | Sparse matrix (SparseMat)   |                    | 15 Feb 2024 22:42 | New Function | 0      |
| 1580 | CoCoALib |             | Normal   | New fn prim for polys   | John Abbott        | 16 Feb 2022 20:45 | New Function | 100    |
| 1532 | CoCoALib |             | Normal   | Convenient RingHom pseudo-ctors   |                    | 07 Mar 2024 21:34 | New Function | 10     |
| 1490 | CoCoALib |             | Normal   | New function: MinusOneToPower   | John Abbott        | 06 Oct 2020 09:53 | New Function | 100    |
| 1488 | CoCoALib |             | High     | BuiltIn Interreduce-Function  | John Abbott        | 15 Mar 2023 08:40 | New Function | 100    |
| 1483 | CoCoALib |             | Normal   | IsPowerOf2 for rationals  | John Abbott        | 26 Oct 2020 21:38 | New Function | 100    |
| 1482 | CoCoALib |             | Normal   | Extended rationals: PlusInfinity and MinusInfinity                      |                    | 16 Feb 2024 18:02 | New Function | 10     |
| 1472 | CoCoALib |             | Low      | Idea for for loops  |                    | 16 Feb 2024 09:55 | New Function | 10     |
| 1470 | CoCoALib |             | Normal   | Get indexed indets from a polyring                                      |                    | 07 Mar 2024 20:36 | New Function | 0      |
| 1468 | CoCoALib |             | Normal   | Adjoin indets to a poly ring  |                    | 15 Feb 2024 22:45 | New Function | 10     |
| 1444 | CoCoALib |             | Normal   | HNF: Hermite Normal Form  |                    | 16 Feb 2024 09:53 | New Function | 0      |
| 1441 | CoCoALib |             | Normal   | GFan: port CoCoA_5 functions into CoCoALib                              | Anna Maria Bigatti | 16 Feb 2024 17:54 | New Function | 0      |
| 1437 | CoCoALib |             | Normal   | Filling matrix row/col from a vector                                    |                    | 15 Feb 2024 22:46 | New Function | 0      |
| 1436 | CoCoALib |             | Low      | Flatten for a matrix  | John Abbott        | 29 Oct 2020 21:36 | New Function | 100    |
| 1433 | CoCoALib |             | Normal   | HilbertDriven Buchberger Algorithm                                      | Anna Maria Bigatti | 16 Feb 2024 18:02 | New Function | 0      |

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|------|----------|-------------|----------|---|--------------------|-------------------|--------------|--------|
| 1427 | CoCoALib |             | Normal   | New function: LawrenceMat   | Anna Maria Bigatti | 06 Mar 2020 16:35 | New Function | 100    |
| 1405 | CoCoALib |             | Normal   | New fn: interreduction  | John Abbott        | 07 Mar 2022 10:07 | New Function | 100    |
| 1339 | CoCoALib |             | Normal   | All PPs of given wdeg   |                    | 16 Oct 2019 14:04 | New Function | 0      |
| 1332 | CoCoALib |             | Normal   | New function: vector of RingElem from string -- in CoCoALib               | Anna Maria Bigatti | 29 Oct 2019 16:21 | New Function | 100    |
| 1306 | CoCoALib |             | Normal   | exgcd over integers (ZZ)  |                    | 08 Mar 2024 17:57 | New Function | 20     |
| 1301 | CoCoALib |             | Normal   | New function primorial  | John Abbott        | 14 Oct 2019 15:10 | New Function | 100    |
| 1299 | CoCoALib |             | Normal   | New fn ConstantTerm?  | John Abbott        | 30 Apr 2020 14:57 | New Function | 100    |
| 1297 | CoCoALib |             | Normal   | New fn: FixedDivisor (formerly IntrinsicContent)                          | John Abbott        | 17 Oct 2019 23:23 | New Function | 100    |
| 1282 | CoCoALib |             | Normal   | subresultant  |                    | 08 Mar 2024 17:54 | New Function | 20     |
| 1278 | CoCoALib |             | Normal   | Port old "clever" code for matrix determinant over ZZ to CoCoALib         |                    | 03 May 2019 11:42 | New Function | 0      |
| 1277 | CoCoALib |             | Normal   | Gaussian row reduction  | John Abbott        | 12 Feb 2020 15:26 | New Function | 100    |
| 1254 | CoCoALib |             | Normal   | New function: MinPoly for pseudo-zero-dimensional ideals                  | Anna Maria Bigatti | 07 Mar 2024 20:25 | New Function | 0      |
| 1251 | CoCoALib |             | Normal   | New function: radical for monomial ideal                                  | Anna Maria Bigatti | 15 Oct 2019 15:29 | New Function | 100    |
| 1235 | CoCoALib |             | Normal   | FreeModule: get canonical basis   | Anna Maria Bigatti | 14 Feb 2022 18:25 | New Function | 100    |
| 1227 | CoCoALib |             | Normal   | exgcd; solve Bezout equation  |                    | 29 Aug 2019 14:55 | New Function | 0      |
| 1212 | CoCoALib |             | Normal   | New function: GBasisByHomog   | Anna Maria Bigatti | 22 Mar 2024 14:32 | New Function | 100    |
| 1210 | CoCoALib |             | Normal   | New Fn: make public "coefficients" (of poly wrt a given PP basis)         | John Abbott        | 08 Aug 2022 20:41 | New Function | 100    |
| 1209 | CoCoALib |             | High     | New function: HasPositiveGrading  | Anna Maria Bigatti | 03 Oct 2019 10:43 | New Function | 100    |
| 1207 | CoCoALib |             | Normal   | New function: SubmoduleOfGBasis   |                    | 18 Mar 2024 09:33 | New Function | 0      |
| 1198 | CoCoALib |             | Normal   | Non-standard DegRevLex (NonStdDegRevLex, WDegRevLex)                      |                    | 23 Sep 2019 12:44 | New Function | 0      |
| 1197 | CoCoALib |             | Normal   | IsZeroDet: new fn   | John Abbott        | 08 Mar 2024 17:58 | New Function | 40     |
| 1178 | CoCoALib |             | Normal   | New function: myPrimaryDecomposition_0dim                                 | Anna Maria Bigatti | 03 Aug 2018 17:41 | New Function | 100    |
| 1176 | CoCoALib |             | Normal   | interval arithmetic   | John Abbott        | 10 Mar 2023 17:46 | New Function | 50     |
| 1173 | CoCoALib |             | Normal   | Upper bound for value of poly in an interval                              |                    | 04 Apr 2018 11:55 | New Function | 0      |
| 1169 | CoCoALib |             | Normal   | New function: RandomLinearForm (CoCoALib)                                 | Anna Maria Bigatti | 02 Aug 2018 16:59 | New Function | 100    |
| 1167 | CoCoALib |             | Normal   | New class VerificationLevel   | John Abbott        | 02 Aug 2018 17:29 | New Function | 100    |
| 1158 | CoCoALib |             | Normal   | New function: MinPolyQuotHeuristic --> MinPolyQuot with VerificationLevel | Anna Maria Bigatti | 02 Aug 2018 16:42 | New Function | 100    |
| 1155 | CoCoALib |             | Normal   | Create a new "prime source" iterator                                      | John Abbott        | 03 Aug 2018 16:11 | New Function | 100    |
| 1154 | CoCoALib |             | Normal   | SmallFpImpl: new ctor arg to say do-not-check-that-arg-is-prime           | John Abbott        | 03 Aug 2018 16:14 | New Function | 100    |
| 1150 | CoCoALib |             | Normal   | New fn: transform ideal with ring hom                                     |                    | 22 Jun 2020 10:34 | New Function | 0      |

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| 1132 | CoCoALib |             | Normal   | Canonical homomorphism for (some) polynomial rings?          | Anna Maria Bigatti | 08 Mar 2024 18:01 | New Function | 0      |
| 1131 | CoCoALib |             | Normal   | Sturm sequence   | John Abbott        | 03 Aug 2018 16:05 | New Function | 100    |
| 1126 | CoCoALib |             | Normal   | New function: SubmoduleOfMinGens                             | Anna Maria Bigatti | 02 Aug 2018 16:20 | New Function | 100    |
| 1108 | CoCoALib |             | Normal   | New fn: IsCoprime (whenever gcd makes sense)                 | John Abbott        | 06 Nov 2017 15:27 | New Function | 100    |
| 1102 | CoCoALib |             | Normal   | Implement RootBound  | John Abbott        | 06 Nov 2017 15:50 | New Function | 100    |
| 1094 | CoCoALib |             | Normal   | Revive code for SelfSaturating GBasis                        | Anna Maria Bigatti | 22 Mar 2024 14:38 | New Function | 50     |
| 1090 | CoCoALib |             | Normal   | ExternalLib-MathSAT: first prototype                         | Anna Maria Bigatti | 19 Dec 2017 07:50 | New Function | 100    |
| 1053 | CoCoALib |             | Normal   | New function: IdealOfGBasis, IdealOfMinGens in CoCoALib      | Anna Maria Bigatti | 20 Nov 2017 16:07 | New Function | 100    |
| 1050 | CoCoALib |             | Normal   | ExternalLibs: function for getting info                      | John Abbott        | 28 Apr 2017 23:17 | New Function | 100    |
| 1033 | CoCoALib |             | Normal   | Split poly into homog parts                                  | John Abbott        | 09 Nov 2017 13:59 | New Function | 100    |
| 1022 | CoCoALib |             | Normal   | New "LF" function which is based on StdDeg                   |                    | 06 Mar 2017 19:37 | New Function | 20     |
| 1008 | CoCoALib |             | Normal   | square function  | John Abbott        | 28 Apr 2017 09:31 | New Function | 100    |
| 1001 | CoCoALib |             | Normal   | CoCoALib: ideas for student projects                         |                    | 18 Feb 2022 16:57 | New Function | 10     |
| 992  | CoCoALib |             | Normal   | Poly ring homomorphism to change ordering                    |                    | 13 Dec 2016 18:04 | New Function | 0      |
| 979  | CoCoALib |             | Normal   | SmallestNonDivisor -- new fn                                 | John Abbott        | 06 Nov 2017 15:12 | New Function | 100    |
| 961  | CoCoALib |             | Normal   | New function: ReducedGBasis                                  | Anna Maria Bigatti | 21 Apr 2017 17:08 | New Function | 100    |
| 958  | CoCoALib |             | Normal   | New function: multiplicity and dim                           | Anna Maria Bigatti | 08 Mar 2024 18:15 | New Function | 80     |
| 957  | CoCoALib |             | Normal   | New function: HasGBasis                                      | Anna Maria Bigatti | 29 Apr 2017 08:32 | New Function | 100    |
| 955  | CoCoALib |             | Normal   | RandomUnimodularMat - random unimodular matrix (of integers) | John Abbott        | 18 Nov 2016 22:39 | New Function | 100    |
| 951  | CoCoALib |             | Normal   | New function: IsSqFree                                       | John Abbott        | 18 Nov 2016 23:09 | New Function | 100    |
| 949  | CoCoALib |             | Normal   | New function: IdealWithIncrementalGBasis(l, f)               | Anna Maria Bigatti | 16 Feb 2024 18:03 | New Function | 0      |
| 947  | CoCoALib |             | Normal   | IsRadical for ideal?   |                    | 23 Jan 2024 22:13 | New Function | 10     |
| 937  | CoCoALib |             | Normal   | LinDepMill: Mill for linear dependencies                     | Anna Maria Bigatti | 18 Apr 2024 16:38 | New Function | 10     |
| 923  | CoCoALib |             | Normal   | Fn to read symbol range (SymbolRange)                        |                    | 16 Sep 2016 15:04 | New Function | 0      |
| 914  | CoCoALib |             | Normal   | New function: quorem for univariate polynomials?             |                    | 22 Aug 2016 16:45 | New Function | 0      |
| 913  | CoCoALib |             | Normal   | Read input from SymbolicData database                        | Anna Maria Bigatti | 02 Aug 2016 10:55 | New Function | 0      |
| 902  | CoCoALib |             | Normal   | New function: FrobeniusMat                                   | Elisa Palezzato    | 28 Apr 2017 09:31 | New Function | 100    |
| 901  | CoCoALib |             | Normal   | New function: PrimaryDecomposition0 in CoCoALib              | Anna Maria Bigatti | 03 Aug 2018 17:40 | New Function | 100    |
| 900  | CoCoALib |             | Normal   | New function: MinPoly of RingElem in quotient ring           | Anna Maria Bigatti | 03 Aug 2018 17:31 | New Function | 100    |
| 899  | CoCoALib |             | High     | IsMaximal, IsPrimary for IDEAL (in cocoalib)                 | Anna Maria Bigatti | 25 Nov 2017 10:40 | New Function | 100    |
| 898  | CoCoALib |             | High     | New function: cardinality of finite field?                   | Anna Maria Bigatti | 08 Mar 2024 17:45 | New Function | 20     |
| 885  | CoCoALib |             | Normal   | IsIrred3: fast 3-way irred test (returning bool3)            |                    | 30 Apr 2019 17:19 | New Function | 10     |

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|-----|----------|-------------|-----------|---|--------------------|-------------------|--------------|--------|
| 873 | CoCoALib |             | Normal    | bool3: add some logical operations?   |                    | 21 Jun 2016 14:37 | New Function | 10     |
| 856 | CoCoALib |             | Normal    | MantissaAndExponent2 for twin-float   | John Abbott        | 28 Apr 2017 09:30 | New Function | 100    |
| 848 | CoCoALib |             | Normal    | Implement MinPoly in CoCoALib   | Anna Maria Bigatti | 22 Mar 2016 18:02 | New Function | 100    |
| 840 | CoCoALib |             | Normal    | GINV: alex basis  |                    | 31 Mar 2016 13:05 | New Function | 10     |
| 838 | CoCoALib |             | Normal    | Differential algebra  |                    | 24 Oct 2016 15:32 | New Function | 10     |
| 836 | CoCoALib |             | Normal    | SmallFpImpl: export fns for a fixed convention  | John Abbott        | 23 Mar 2016 15:10 | New Function | 100    |
| 828 | CoCoALib |             | Normal    | MachineInt: function for checking that value is greater than some lower limit (and below MAXLONG) | John Abbott        | 15 Apr 2024 10:08 | New Function | 20     |
| 817 | CoCoALib |             | High      | GenRepr in CoCoALib?  |                    | 17 Nov 2016 14:12 | New Function | 0      |
| 813 | CoCoALib |             | Immediate | Implement "elim" in CoCoALib  | Anna Maria Bigatti | 18 Mar 2024 15:58 | New Function | 90     |
| 812 | CoCoALib |             | Normal    | PPMonoid pseudo-ctor without explicit ordering  |                    | 24 Nov 2015 18:16 | New Function | 0      |
| 811 | CoCoALib |             | Normal    | Add new fn SimplestBinaryRatBetween   | John Abbott        | 23 Mar 2016 15:10 | New Function | 100    |
| 803 | CoCoALib |             | Normal    | PPOrdering: use it to compute WDeg?   |                    | 06 Nov 2017 14:00 | New Function | 10     |
| 802 | CoCoALib |             | Urgent    | DivMask: extend interface?  | John Abbott        | 08 Mar 2024 17:36 | New Function | 50     |
| 801 | CoCoALib |             | Normal    | Test whether a symbol is in a ring  |                    | 07 Mar 2024 21:36 | New Function | 0      |
| 800 | CoCoALib |             | Urgent    | PPMonoidSparse: impl of sparse PPs  | John Abbott        | 09 Mar 2023 22:15 | New Function | 100    |
| 796 | CoCoALib |             | Normal    | CoCoALib function for radical (or SqFree) of a polynomial   | John Abbott        | 06 Nov 2017 15:31 | New Function | 100    |
| 795 | CoCoALib |             | Normal    | Add new fn InvModNoCheck  | John Abbott        | 21 Mar 2016 16:57 | New Function | 100    |
| 762 | CoCoALib |             | Normal    | ExternalLib-GFan: first prototype   | Anna Maria Bigatti | 24 Mar 2016 08:04 | New Function | 100    |
| 738 | CoCoALib |             | Normal    | Extend homomorphism to polynomial ring  |                    | 25 Jun 2015 17:23 | New Function | 10     |
| 735 | CoCoALib |             | Normal    | Convert a PPMonoidElem to RingElem with coefficient one   | Anna Maria Bigatti | 22 Mar 2016 17:59 | New Function | 100    |
| 728 | CoCoALib |             | Normal    | Noncommutative algebra "of solvable type"   |                    | 09 Jul 2015 08:39 | New Function | 10     |
| 715 | CoCoALib |             | Normal    | RandomSubsetIndices, RandomTupleIndices?  | John Abbott        | 30 Jul 2015 17:39 | New Function | 100    |
| 714 | CoCoALib |             | Normal    | Interrupt mechanism   | John Abbott        | 28 Jun 2015 20:46 | New Function | 100    |
| 703 | CoCoALib |             | Normal    | Add more operations between modules (CoCoALib)  | Anna Maria Bigatti | 27 Oct 2017 11:53 | New Function | 10     |
| 690 | CoCoALib |             | Normal    | Fault tolerant rational reconstruction: implement simultaneous version                            |                    | 23 Apr 2015 19:12 | New Function | 0      |
| 678 | CoCoALib |             | Normal    | Accumulator (like a geobucket)  |                    | 17 Nov 2016 19:03 | New Function | 20     |
| 667 | CoCoALib |             | Normal    | factor: multivariate + finite characteristic  |                    | 04 Mar 2015 20:08 | New Function | 0      |
| 665 | CoCoALib |             | Normal    | Integrate Janet/Pommaret basis code   | John Abbott        | 12 Jun 2018 18:36 | New Function | 10     |
| 664 | CoCoALib |             | Urgent    | Impl small non-prime finite fields (using logs)   | John Abbott        | 14 Mar 2023 19:49 | New Function | 80     |
| 661 | CoCoALib |             | Normal    | Laurent polynomials   |                    | 23 Jan 2015 13:50 | New Function | 0      |
| 658 | CoCoALib |             | Urgent    | Indets actually in a poly (or vector or matrix)   | John Abbott        | 13 Feb 2020 15:09 | New Function | 100    |

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|-----|----------|-------------|----------|--|--------------------|-------------------|--------------|--------|
| 651 | CoCoALib |             | Normal   | Optimized algorithms for implicitization (slicing algorithm, elim, subalgebra..) |                    | 12 Feb 2015 10:33 | New Function | 10     |
| 644 | CoCoALib |             | Normal   | Buchberger-Moeller: add option to stop as soon as 1 poly has been found          | John Abbott        | 06 Nov 2017 13:58 | New Function | 0      |
| 638 | CoCoALib |             | Normal   | Time limit: let user specify time limit for a computation                        | John Abbott        | 08 Nov 2017 16:33 | New Function | 100    |
| 630 | CoCoALib |             | Normal   | Add graeffe function?  | John Abbott        | 20 Dec 2017 15:51 | New Function | 100    |
| 628 | CoCoALib |             | Normal   | Complex twin-floats  |                    | 22 Sep 2014 18:16 | New Function | 0      |
| 627 | CoCoALib |             | Normal   | Gaussian integer and rationals ZZi, QQi  |                    | 23 Sep 2014 16:30 | New Function | 0      |
| 625 | CoCoALib |             | Normal   | NumTheory: sieve of Eratosthenes   | John Abbott        | 11 May 2015 16:05 | New Function | 100    |
| 623 | CoCoALib |             | Normal   | Inverse of a matrix over ZZ  | Anna Maria Bigatti | 11 May 2015 17:54 | New Function | 100    |
| 620 | CoCoALib |             | Normal   | Redesign CRTMill   | John Abbott        | 21 Mar 2016 14:30 | New Function | 20     |
| 602 | CoCoALib |             | Normal   | OrdMat: should it be a reference to a MatrixView in all PPOOrderings?            | John Abbott        | 23 Mar 2016 15:24 | New Function | 100    |
| 589 | CoCoALib |             | Normal   | Implement gin (generic initial ideal) in cocoalib                                | Anna Maria Bigatti | 15 Jul 2014 18:17 | New Function | 0      |
| 587 | CoCoALib |             | Normal   | port to CoCoALib: Homomorphism pkg (ker, IsInjective, IsSurjective..)            | John Abbott        | 03 Aug 2018 18:11 | New Function | 100    |
| 585 | CoCoALib |             | Normal   | (Hilbert-) quasi-polynomials   | John Abbott        | 29 Jul 2014 11:18 | New Function | 100    |
| 584 | CoCoALib |             | Normal   | BaseRing for all rings   | John Abbott        | 31 Jul 2014 16:55 | New Function | 100    |
| 583 | CoCoALib |             | Normal   | New function for printing with extra information                                 |                    | 07 Jul 2014 11:48 | New Function | 0      |
| 571 | CoCoALib |             | Normal   | CmpAbs for RingElem  | John Abbott        | 17 Jul 2014 14:26 | New Function | 100    |
| 570 | CoCoALib |             | Normal   | Allow use of RingElem instead of ring in some functions (e.g. PPM, CoeffRing)    |                    | 16 Jul 2014 14:43 | New Function | 0      |
| 565 | CoCoALib |             | Normal   | FloatApprox for TwinFloat values?  | John Abbott        | 19 Jul 2016 22:44 | New Function | 20     |
| 554 | CoCoALib |             | Normal   | CoCoALib-Normaliz interface: cannot print a cone                                 | Christof Soeger    | 28 Jul 2014 21:43 | New Function | 100    |
| 540 | CoCoALib |             | Normal   | Progress reporter  | John Abbott        | 20 May 2014 10:34 | New Function | 100    |
| 539 | CoCoALib |             | Low      | Functions to clean up a factorization  |                    | 22 Jan 2024 20:28 | New Function | 0      |
| 533 | CoCoALib |             | Normal   | Convert BigInt/BigRat to string  | John Abbott        | 20 May 2014 10:33 | New Function | 100    |
| 526 | CoCoALib |             | Normal   | Fn to test if an integer is a power of 2   | John Abbott        | 15 Apr 2014 12:43 | New Function | 100    |
| 520 | CoCoALib |             | High     | Compute inverse in quotient ring (i.e. division in algebraic extn)               | Anna Maria Bigatti | 01 Jul 2015 18:40 | New Function | 100    |
| 515 | CoCoALib |             | Normal   | Fn to "flatten" multiple polynomial extns  |                    | 10 Jul 2014 14:22 | New Function | 0      |
| 513 | CoCoALib |             | High     | Quick/correct flag for bool3 fns   |                    | 10 Jul 2014 16:30 | New Function | 10     |
| 496 | CoCoALib |             | Normal   | ideal: minimize or minimized?  | Anna Maria Bigatti | 01 Apr 2014 18:52 | New Function | 100    |
| 459 | CoCoALib |             | Low      | LinearSimplify: port to CoCoALib   |                    | 20 May 2014 09:47 | New Function | 0      |
| 442 | CoCoALib |             | Normal   | Eigenvectors   |                    | 09 Jul 2014 18:05 | New Function | 0      |
| 440 | CoCoALib |             | High     | Port RealRoots to C++  | John Abbott        | 19 Oct 2016 10:26 | New Function | 0      |

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|-----|----------|-------------|-----------|--|--------------------|-------------------|--------------|--------|
| 436 | CoCoALib |             | Normal    | Improve UPoly eval at BigRat for binary rational                         |                    | 01 Aug 2014 08:59 | New Function | 0      |
| 431 | CoCoALib |             | Normal    | NewPolyRing_DMPI has no constructor with a predefined PPM                | John Abbott        | 17 Apr 2014 18:39 | New Function | 100    |
| 416 | CoCoALib |             | Normal    | New fn: NumPartitions  | John Abbott        | 03 Apr 2014 11:53 | New Function | 100    |
| 409 | CoCoALib |             | High      | Minimal syzygies (optimized implementation)                              | Anna Maria Bigatti | 31 Jul 2014 12:36 | New Function | 0      |
| 407 | CoCoALib |             | Normal    | RingElem ctor from mpz_t (from Bruns)                                    | John Abbott        | 03 Apr 2014 11:53 | New Function | 100    |
| 400 | CoCoALib |             | Normal    | add myJBMill member field to ideal                                       |                    | 15 Sep 2014 12:04 | New Function | 0      |
| 399 | CoCoALib |             | High      | add myHilbertSeries member field to ideal and (sub)module                | Anna Maria Bigatti | 30 Jul 2014 17:04 | New Function | 0      |
| 390 | CoCoALib |             | Normal    | Store unique copy of QQ[t_1..t_n] (RingQQt) in GlobalManager             | John Abbott        | 29 Oct 2013 14:30 | New Function | 90     |
| 387 | CoCoALib |             | High      | implement algorithm(s) for resolutions                                   | Anna Maria Bigatti | 30 Jul 2014 17:04 | New Function | 0      |
| 386 | CoCoALib |             | High      | add resolution data type   | Anna Maria Bigatti | 11 Jun 2015 14:58 | New Function | 10     |
| 383 | CoCoALib |             | Normal    | Resolution/morse: integrate Mario Albert's code into CoCoALib            | John Abbott        | 31 Jul 2014 14:57 | New Function | 60     |
| 374 | CoCoALib |             | Immediate | Porting "IdealOfProjectivePoints"  | John Abbott        | 08 Feb 2019 20:56 | New Function | 100    |
| 373 | CoCoALib |             | Normal    | add DeleteCol, DeleteRow   | Anna Maria Bigatti | 17 Apr 2014 09:51 | New Function | 100    |
| 366 | CoCoALib |             | High      | function (CoCoALib) for minimal generators (like old Minimalize)         | Anna Maria Bigatti | 03 Apr 2014 11:52 | New Function | 100    |
| 361 | CoCoALib |             | Normal    | implement IsPrime3, IsMaximal3   | John Abbott        | 25 Nov 2017 10:42 | New Function | 100    |
| 357 | CoCoALib |             | Normal    | Constructor for vectors? CoCoAVector                                     | Anna Maria Bigatti | 12 Feb 2020 14:43 | New Function | 100    |
| 356 | CoCoALib |             | Normal    | IsZeroDivisor  | Anna Maria Bigatti | 17 Apr 2014 09:23 | New Function | 100    |
| 354 | CoCoALib |             | Normal    | New function BinRepr (was BinExp, also known as Macaulay representation) | John Abbott        | 29 May 2013 16:41 | New Function | 100    |
| 349 | CoCoALib |             | Urgent    | IdealOfPoints: gens are actually a GBasis                                | Anna Maria Bigatti | 29 Oct 2013 13:39 | New Function | 100    |
| 342 | CoCoALib |             | Normal    | Remove denominators: QQ[x] -> ZZ[x] (and PushBack(coeff, PP))            | John Abbott        | 17 Apr 2014 09:23 | New Function | 100    |
| 337 | CoCoALib |             | Normal    | Module homs  |                    | 31 Jul 2014 12:40 | New Function | 0      |
| 335 | CoCoALib |             | Urgent    | Equality of (sub)modules   | Anna Maria Bigatti | 29 Oct 2013 13:33 | New Function | 100    |
| 320 | CoCoALib |             | Normal    | PPMonoid pseudo-ctors without symbol names                               | John Abbott        | 05 Mar 2013 18:16 | New Function | 0      |
| 313 | CoCoALib |             | High      | Elim(vector<long>) as PPOrderingCtor                                     | Anna Maria Bigatti | 22 Mar 2024 18:17 | New Function | 30     |
| 312 | CoCoALib |             | Normal    | LongRange(a,b) returning vector of long a..b (included)                  | Anna Maria Bigatti | 03 Apr 2014 11:38 | New Function | 100    |
| 311 | CoCoALib |             | Immediate | XelMat, StdDegRevLexMat, ... should be MatrixView                        | John Abbott        | 20 Jan 2017 15:16 | New Function | 100    |
| 304 | CoCoALib |             | High      | Module ordering and grading (and shifts)                                 | Anna Maria Bigatti | 31 Jul 2014 15:01 | New Function | 100    |
| 303 | CoCoALib |             | Normal    | Rows and Columns of a matrix   | John Abbott        | 09 Jan 2020 22:17 | New Function | 100    |
| 300 | CoCoALib |             | Normal    | Add fault tolerant rational reconstruction to library                    | John Abbott        | 03 Jun 2013 17:31 | New Function | 100    |
| 297 | CoCoALib |             | Normal    | Modules design: brainstorming  |                    | 31 Jul 2014 14:55 | New Function | 30     |
| 289 | CoCoALib |             | Normal    | PrimeField -- new fn?  |                    | 01 Aug 2014 08:59 | New Function | 0      |

| #   | Project  | Parent task                                    | Priority | Subject   | Assignee           | Updated           | Category     | % Done |
|-----|----------|--|----------|---|--------------------|-------------------|--------------|--------|
| 283 | CoCoALib |  | Normal   | Rational approximation  | John Abbott        | 18 Feb 2013 20:19 | New Function | 100    |
| 278 | CoCoALib |  | Normal   | add CoeffVecWRT to cocoalib                                       | John Abbott        | 29 Oct 2013 14:50 | New Function | 100    |
| 259 | CoCoALib |  | Normal   | Squarefree(?) GCD-free basis                                      | John Abbott        | 09 Jan 2020 22:22 | New Function | 100    |
| 254 | CoCoALib |  | Normal   | How to return a Hilbert Series in CoCoALib                        | John Abbott        | 17 Apr 2014 15:19 | New Function | 100    |
| 248 | CoCoALib |  | Normal   | IsDivisible for RingElem with nice interface                      | Anna Maria Bigatti | 01 Apr 2014 19:13 | New Function | 100    |
| 246 | CoCoALib |  | Normal   | Approx QIR  |                    | 04 Apr 2014 17:16 | New Function | 0      |
| 241 | CoCoALib |  | Normal   | AreMonomials  | Anna Maria Bigatti | 01 Oct 2012 18:26 | New Function | 100    |
| 236 | CoCoALib |  | Normal   | Add homog (homogenized) for ideal                                 | Anna Maria Bigatti | 23 May 2013 08:26 | New Function | 100    |
| 233 | CoCoALib |  | Normal   | AsINT and AsRAT -- ConvertTo<BigInt> and ConvertTo<BigRat>        | John Abbott        | 02 Apr 2014 09:19 | New Function | 100    |
| 229 | CoCoALib |  | Normal   | Generator for random ring elements                                |                    | 01 Aug 2014 08:59 | New Function | 0      |
| 227 | CoCoALib |  | Normal   | HilbertBasis from Normaliz: full-lattice or not?                  |                    | 31 Jul 2014 12:39 | New Function | 0      |
| 224 | CoCoALib |  | Normal   | Leading form  | Anna Maria Bigatti | 27 Jan 2014 14:59 | New Function | 100    |
| 223 | CoCoALib |  | Normal   | Automatic mapping of RingElems                                    | Anna Maria Bigatti | 10 Jul 2014 13:38 | New Function | 100    |
| 219 | CoCoALib |  | Normal   | myDeriv for RingDenseUPolyClean still missing                     | Anna Maria Bigatti | 02 Apr 2014 08:49 | New Function | 100    |
| 215 | CoCoALib |  | Normal   | Janet Bases: check and include code in CoCoALib (first prototype) | Anna Maria Bigatti | 24 Mar 2016 11:50 | New Function | 100    |
| 211 | CoCoALib |  | Normal   | NBM: add SparsePolyRing as argument for ordering                  | John Abbott        | 18 Feb 2013 16:48 | New Function | 100    |
| 210 | CoCoALib |  | Normal   | Normaliz: "double" cone for speed and safety                      | John Abbott        | 18 Feb 2013 16:25 | New Function | 100    |
| 209 | CoCoALib |  | High     | ReadExpr: input polynomials in CoCoALib                           | Anna Maria Bigatti | 27 Aug 2014 18:38 | New Function | 100    |
| 206 | CoCoALib |  | Urgent   | Matrix equation solving: LinKer                                   |                    | 22 Mar 2024 09:42 | New Function | 30     |
| 203 | CoCoALib |  | High     | Function to get the Hilbert Polynomial ring from GlobalManager    | Anna Maria Bigatti | 03 Apr 2014 11:52 | New Function | 100    |
| 174 | CoCoALib |  | Normal   | IsStdGraded: add for PPOrdering, PPMonoid, (Sparse)PolyRing..     |                    | 01 Aug 2014 08:59 | New Function | 0      |
| 156 | CoCoALib |  | Normal   | Brand new symbol(s)   |                    | 28 May 2012 16:13 | New Function | 100    |
| 151 | CoCoALib |  | Normal   | Iterated CanonicalHom   |                    | 13 May 2015 09:58 | New Function | 0      |
| 147 | CoCoALib | Feature #143: Buchberger-Moeller (parent task) | Urgent   | Buchberger-Moeller: impl via modular reduction                    | John Abbott        | 10 Jul 2014 14:18 | New Function | 20     |
| 146 | CoCoALib |  | Normal   | Buchberger-Moeller: input conversions                             |                    | 10 Jul 2014 14:17 | New Function | 0      |
| 145 | CoCoALib | Feature #143: Buchberger-Moeller (parent task) | Urgent   | Buchberger-Moeller: fast modular impl                             | John Abbott        | 10 Jul 2014 14:17 | New Function | 0      |
| 144 | CoCoALib | Feature #143: Buchberger-Moeller (parent task) | Normal   | Buchberger-Moeller: generic impl                                  | John Abbott        | 29 Oct 2013 14:50 | New Function | 100    |

| #   | Project  | Parent task  | Priority | Subject  | Assignee           | Updated           | Category     | % Done |
|-----|----------|--|----------|--|--------------------|-------------------|--------------|--------|
| 143 | CoCoALib |  | Urgent   | Buchberger-Moeller (parent task)   | John Abbott        | 10 Jul 2014 14:16 | New Function | 38     |
| 134 | CoCoALib |  | Normal   | Convenience ring ctors and homs  |                    | 11 Jul 2014 12:06 | New Function | 0      |
| 129 | CoCoALib |  | Normal   | Better GCD   |                    | 09 Jul 2014 18:08 | New Function | 0      |
| 127 | CoCoALib |  | Normal   | Convert DUPFF code to C++  | John Abbott        | 28 Sep 2022 15:04 | New Function | 50     |
| 125 | CoCoALib |  | Normal   | Matrix equation solving; linear system solving                           | John Abbott        | 18 Mar 2024 10:00 | New Function | 50     |
| 123 | CoCoALib |  | Normal   | IdealOfPoints with generic coeffs  |                    | 09 Jul 2014 18:15 | New Function | 0      |
| 122 | CoCoALib |  | Normal   | Porting "LinKer"   | John Abbott        | 15 Jan 2021 21:10 | New Function | 100    |
| 121 | CoCoALib |  | Urgent   | Porting "IdealOfPoints"  | John Abbott        | 29 May 2013 16:58 | New Function | 100    |
| 116 | CoCoALib |  | Urgent   | ordering matrices with rational coefficients                             | Anna Maria Bigatti | 02 Apr 2012 15:22 | New Function | 100    |
| 113 | CoCoALib |  | Normal   | Introduce PartialHom   | John Abbott        | 09 Jul 2014 18:04 | New Function | 10     |
| 107 | CoCoALib |  | Normal   | Recognizing finite fields  | John Abbott        | 27 Jun 2016 08:48 | New Function | 100    |
| 91  | CoCoALib |  | High     | Return type & name for "indets" of a PP                                  | John Abbott        | 14 Feb 2020 13:26 | New Function | 100    |
| 72  | CoCoALib | Feature #68: cleanup doc for matrix, MatrixViews, *Matrix*,.....             | Low      | MatByRows, MatByCols   | John Abbott        | 31 Jul 2014 14:54 | New Function | 100    |
| 69  | CoCoALib | Feature #46: Squarefree factorization - univariate polynomials, char $p > 0$ | Normal   | p-th root  | John Abbott        | 04 Jul 2012 10:48 | New Function | 100    |
| 62  | CoCoALib |  | Normal   | polynomial coefficient extraction w.r.t. single variable -- dense output | John Abbott        | 01 Aug 2014 16:25 | New Function | 100    |
| 51  | CoCoALib |  | Normal   | polynomial coefficient extraction w.r.t. variable                        | John Abbott        | 27 May 2013 18:19 | New Function | 100    |
| 50  | CoCoALib |  | Normal   | Polynomial content   | John Abbott        | 27 May 2013 18:16 | New Function | 100    |
| 49  | CoCoALib | Feature #47: Squarefree factorization - multivariate polynomials             | Normal   | Squarefree factorization - multivariate polynomials, char $p > 0$        | John Abbott        | 29 Oct 2013 12:35 | New Function | 100    |
| 48  | CoCoALib | Feature #47: Squarefree factorization - multivariate polynomials             | Normal   | Squarefree factorization - multivariate polynomials, char 0              | John Abbott        | 05 Nov 2015 16:16 | New Function | 100    |
| 47  | CoCoALib | Feature #43: Squarefree factorization - for polynomials                      | Normal   | Squarefree factorization - multivariate polynomials                      | John Abbott        | 02 Apr 2014 18:57 | New Function | 100    |
| 46  | CoCoALib | Feature #44: Squarefree factorization - univariate polynomials               | Normal   | Squarefree factorization - univariate polynomials, char $p > 0$          | John Abbott        | 29 Oct 2013 12:35 | New Function | 100    |



| #  | Project  | Parent task  | Priority | Subject   | Assignee           | Updated           | Category     | % Done |
|----|----------|--|----------|---|--------------------|-------------------|--------------|--------|
| 45 | CoCoALib | Feature #44:<br>Squarefree factorization<br>- univariate polynomials | Normal   | Squarefree factorization - univariate polynomials, char 0   | John Abbott        | 29 Oct 2013 12:34 | New Function | 100    |
| 44 | CoCoALib | Feature #43:<br>Squarefree factorization<br>- for polynomials        | Normal   | Squarefree factorization - univariate polynomials           | John Abbott        | 29 Oct 2013 12:34 | New Function | 100    |
| 43 | CoCoALib | Feature #39:<br>Squarefree factorization                             | Normal   | Squarefree factorization - for polynomials                  | John Abbott        | 29 Oct 2013 12:33 | New Function | 100    |
| 42 | CoCoALib | Feature #39:<br>Squarefree factorization                             | Normal   | Squarefree factorization - generic case                     | John Abbott        | 29 Oct 2013 12:32 | New Function | 100    |
| 41 | CoCoALib | Feature #39:<br>Squarefree factorization                             | Normal   | Squarefree factorization - overhead                         | John Abbott        | 29 Oct 2013 12:32 | New Function | 100    |
| 40 | CoCoALib | Feature #39:<br>Squarefree factorization                             | Normal   | Squarefree factorization - Alessio d'Ali`                   | John Abbott        | 29 Oct 2013 12:32 | New Function | 100    |
| 39 | CoCoALib |  | Normal   | Squarefree factorization                                    | John Abbott        | 02 Apr 2014 18:58 | New Function | 100    |
| 30 | CoCoALib |  | High     | SwapRows, Cols  | Anna Maria Bigatti | 05 Jul 2012 10:40 | New Function | 100    |
| 17 | CoCoALib |  | Normal   | implement "binomial" (coefficient) for RingElem             | John Abbott        | 17 Apr 2014 09:22 | New Function | 100    |
| 15 | CoCoALib |  | High     | Adjoint of a non-invertible matrix                          | John Abbott        | 16 Sep 2021 13:48 | New Function | 100    |
| 11 | CoCoALib |  | Normal   | Bareiss algorithm   | John Abbott        | 10 Oct 2019 18:45 | New Function | 100    |
| 5  | CoCoALib |  | Normal   | Coefficient extraction                                      | John Abbott        | 17 Apr 2014 09:22 | New Function | 100    |
| 4  | CoCoALib |  | Normal   | Squarefree GCD-free basis                                   | John Abbott        | 27 Jan 2020 17:58 | New Function | 100    |
| 3  | CoCoALib |  | Normal   | implement creation of a PPMonoidElement from vector<BigInt> | John Abbott        | 15 Mar 2013 17:35 | New Function | 100    |