Appendix 8: Pictures of prime numbers and ideals for real fields of class number 3

The pictures show the quadratic character and a picture of prime numbers, units and two mutually conjugate classes of non-principal prime ideals, one class red, and the other class green for some real quadratic fields of class number 3, namely

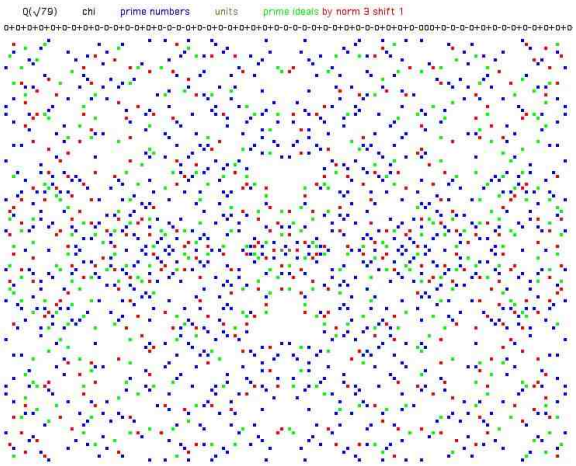
the fields of discriminant congruent 0 modulo 4:

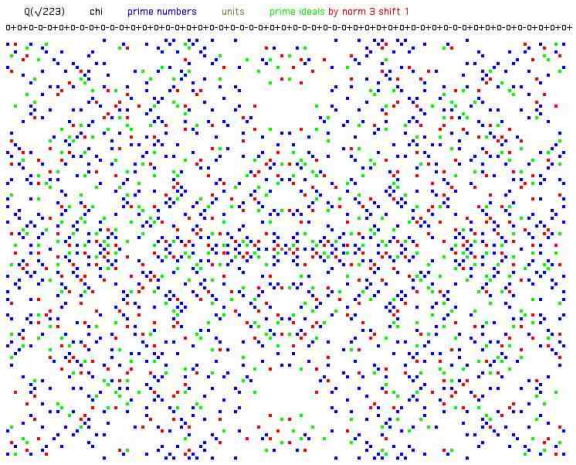
$Q(\sqrt{79}), Q(\sqrt{142}), Q(\sqrt{223}), Q(\sqrt{254}), Q(\sqrt{326}), Q(\sqrt{359})$

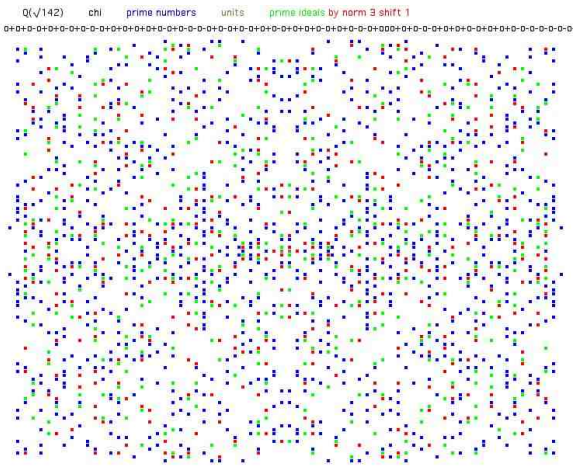
and the fields of discriminant congruent 1 modulo 4:

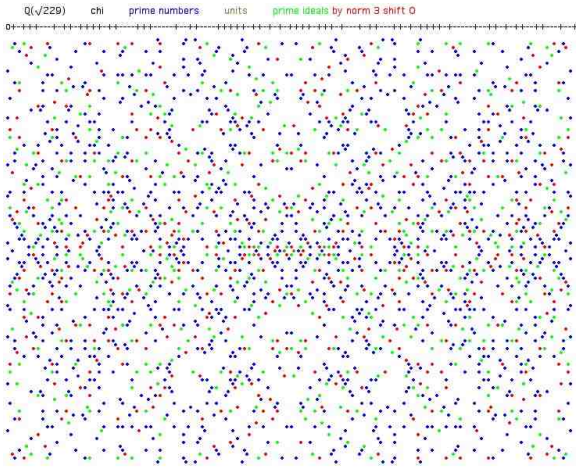
$Q(\sqrt{229}), Q(\sqrt{257}), Q(\sqrt{321})$.

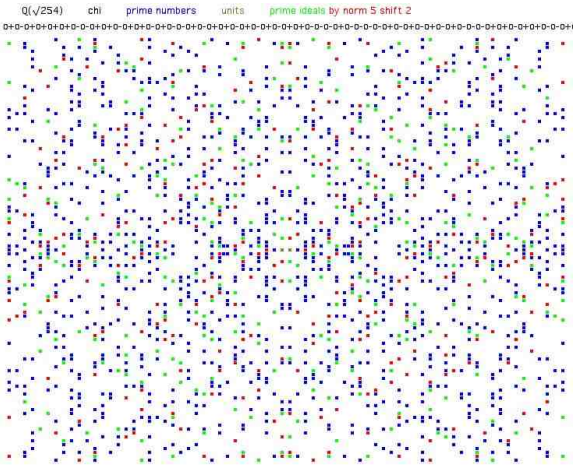
The pictures display the prime numbers, which generate the principal prime ideals, but not those irreducible numbers which are not prime.
Moreover, the non-principal prime ideals are displayed as follows.
The non-principal ideals are obtained by dividing principal ideals by a certain non-principal prime ideal, I, or its conjugate, where I := [norm, ζ], ζ := shift + (d mod 4 + √d) / 2,
i.e. I is generated by 'norm' being its norm, and the integer ζ of $Q(\sqrt{r})$.
In the picture, the non-principal prime ideals then are represented by those numbers whose norm is equal to a prime norm times the norm of I. This norm of I and shift are mentioned at the top of the picture, shift being needed to distinguish between the two mutually conjugate classes of non-principal ideals.

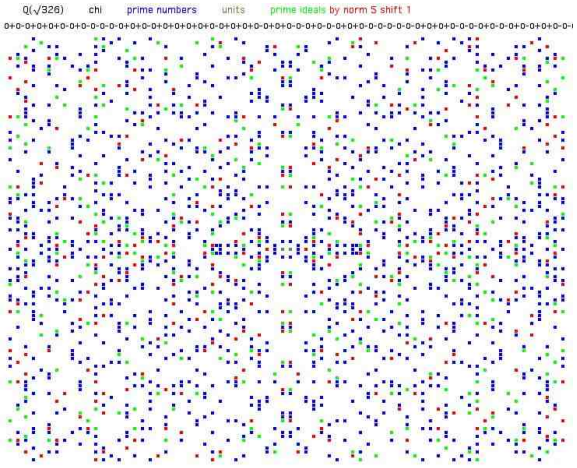


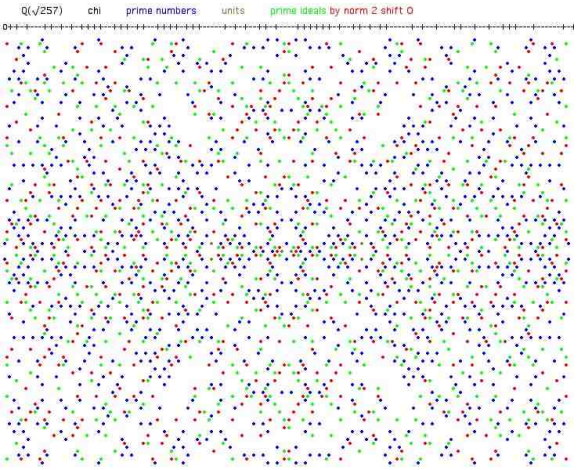


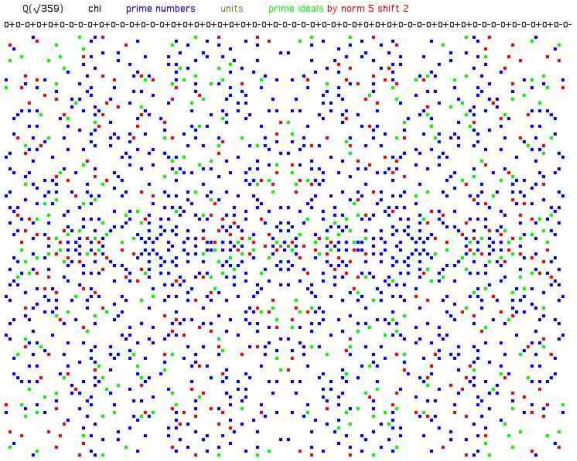


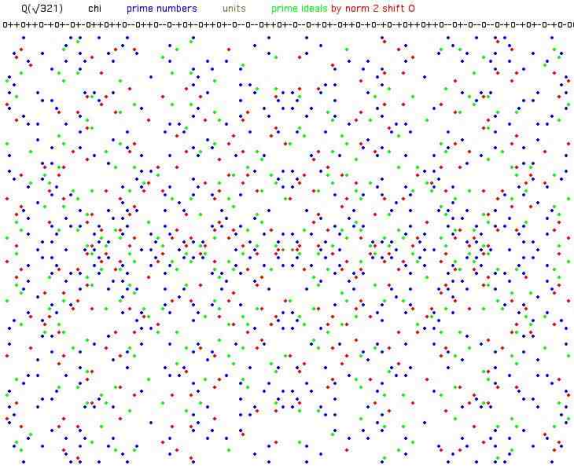



Q(√254) chi prime numbers units prime ideals by norm 5 shift 2


Q(√326) chi prime numbers units prime ideals by norm 5 shift 1


Q(√257) chi prime numbers units prime ideals by norm 2 shift 0


Q(√359) chi prime numbers units prime ideals by norm 5 shift 2


Q(√321) chi prime numbers units prime ideals by norm 2 shift 0