

**Deutsche Mathematiker-Vereinigung**

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15.-20.9.1991  
in  
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**Programm**

## Donnerstag

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	Bui, M. (Budapest): A characterization of some arithmeti- cal functions	16 <sup>00</sup>
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### Dihedral fields from quadratic infrastructure

Daniel C. Mayer, Department of Computer Science, University of Manitoba Winnipeg, Canada  
Donnerstag, 19.9.1991, 14<sup>30</sup>, U2-205

Up to now, extensive tables of non-cyclic cubic fields have been produced exclusively by the time consuming investigation of the indices of lots of polynomials in a sufficiently large set which, unfortunately, always contains a very high percentage of superfluous outrange polynomials. Llorente and Quer covered the range  $0 < D < 10^7$  of positive discriminants by this oldfashioned method, and Fung and Williams computed the negative range  $-10^6 < D < 0$ .

In this talk we present new sophisticated algorithms for the rapid construction of all discriminants  $d_L$  between assigned bounds  $l < |d_L| < u$  of (either simply or totally real) non-Galois fields  $L$  of degree  $p$  (a fixed odd rational prime) with dihedral normal closure of degree  $2p$ . The theoretical background of these algorithms is provided, first, by the *arithmetic of dihedral extensions as radical fields* and, second, by D. Shanks' concept of *quadratic infrastructure*.

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