

NEW DEVELOPMENTS IN ELECTRONIC PUBLISHING OF MATHEMATICS
a workshop integrating mathematicians, libraries, editors and publishers
Stockholm, June 25-27, 2004

An official satellite conference to the ECM 2004

***The development of Electronic Publishing
within the Italian National Information System for Mathematics***

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Full-paper

Since 1991 SIBA Coordination¹ of the University of Lecce coordinates the *Italian National Information System for Mathematics (SINM)*, in agreement with the Italian mathematical libraries of Universities and Research Organizations.

This Information System enables the Italian mathematical community to have an easy access to a coordinated system of bibliographical, documentary, full-text and multimedia resources. It aims at the development, diffusion and sharing of electronic information resources regarding mathematics with the smallest possible waste of technical and financial resources.

Within this Information System, SIBA Coordination has developed many national projects for the cataloguing, digitalization and fruition of bibliographical and documentary material, for the publication and consultation of electronic journals and for the conversion to electronic format of the back volumes.

In particular, SIBA Coordination has developed: the *SINM portal*, accessible at the URL <http://siba2.unile.it/sinm>; the *National Journals Catalogue of Mathematical, Physical, Computer and Technological Sciences*; the *National OldenMath Catalogue*; the *Italian National Index of Mathematical Preprints SINM-MPRESS*; the *REIM System*; the *Italian Editorial Unit of Zentralblatt MATH*.

The *National Journals Catalogue of Mathematical, Physical, Computer and Technological Sciences* contains the bibliographical descriptions and holdings of the journals of the Italian scientific libraries belonging to SINM; moreover it contains the bibliographical descriptions of the journals available in electronic format and links to the relevant Web sites.

¹ SIBA Coordination (<http://siba2.unile.it>) is the structure of the University of Lecce (Italy) that coordinates the Computer Services for the University Libraries, the development of the Telematic Information System for Research and Education and numerous activities and national and international projects for the acquisition and utilization, through electronic media, of bibliographic and documentary material, as well as of archaeological finds, environments and architectural structures.

The Catalogue, accessible via the Web at the URL <http://siba2.unile.it/archives/bibsearch.html>, allows the user to find the desired information in an extremely simple way, to request automatically copies of journal articles by e-mail (clicking on the library of interest and the relevant e-mail address), exclusively for scientific purposes and according to the rules of copyright, or to access directly the electronic version available on the Web servers either of the publishers or of the CASPUR, Rome (<http://periodici.caspur.it>) or through the Digital Library of CILEA, Milano.

Moreover, dynamic links enable to extend to the Catalogue the search on the databases available via the Web servers of the University of Lecce and, in particular, on *ZMATH* (<http://siba-sinmdb.unile.it/ZMATH>) and *MATHDI* (<http://siba-sinmdb.unile.it/MATHDI>), in order to locate journals and to find documents.

The National *OldenMath* Catalogue, accessible via the Web at the URL <http://siba3.unile.it/archives/omsearch.html>, contains the bibliographical descriptions of old, rare and valuable editions held by SINM mathematics libraries, as well as the partial or entire digital reproduction of the same editions.

SINM-MPRESS (<http://siba-sinm.unile.it/mpress>) is the Italian National Index of Mathematical Preprints; it collects and indexes the preprints of Italian mathematicians, and is included in the international system MPRESS/MathNet.preprints (Mathematics Preprint Search System, <http://mathnet.preprints.org>).

It is based on Harvest, a highly flexible software that works in a distributed way, giving the possibility to index both preprints entirely hosted on the SINM-MPRESS server and those stored on other Web sites. Moreover, SINM-MPRESS is interoperable with the ETRDL System (<http://dienst.isti.cnr.it>) of Computer Sciences and Applied Mathematics preprints of CNR and ERCIM (European Research Consortium for Informatics and Mathematics).

REIM (Riviste Elettroniche Italiane di Matematica = Italian Electronic Mathematical Journals) is a project aiming at the coordination and the development of the National System for the Web publication and consultation of the Italian electronic mathematical journals.

The project aims also at the conversion to electronic format of the back volumes of the journals, based on the system developed by EMIS (European Mathematical Information Service, <http://siba-sinmemis.unile.it>) within the ERAM project (Electronic Research Archive for Mathematics, <http://www.emis.de/projects/JFM>).

The REIM System for the management and consultation of electronic journals has been implemented by SIBA Coordination in January 2000 with the publication of the electronic version of the Journal "Note di Matematica" (<http://siba2.unile.it/notemat>) by the University of Lecce. The System has been then developed and enlarged through the publication and the indexing of other Italian mathematical journals.

Like the ESE System (<http://siba2.unile.it/ese>), implemented by the same SIBA Coordination within the ESE project (Electronic Scientific Publishing of University of Lecce), REIM is based on standard and open technologies (SQL, PHP), on the use of standard formats for the access and electronic distribution of documents (PDF, PostScript, TeX) and on the use of standard communication protocols (HTTP).

REIM enables the editorial management of electronic journals to load full-text documents and to manage the relative metadata by means of a specific Web interface (<http://siba2.unile.it/sinm/reim>).

Moreover it allows to consult journals by means of a sole Web interface (<http://siba2.unile.it/sinm/reim/search>). It enables to search by title, author, abstract, keywords, MSC classification (Mathematical Subject Classification), DOI code (Digital Object Identifier) and full-text contemporaneously on one or more journals.

All searchable fields are indexed in order to provide users with faster and more effective searches and more relevant results.

Each indexed article in the REIM System has a DOI code (assigned by SIBA Coordination) automatically generated and registered by the same system in the international index (DOI Directory).

The DOI coding is universally acknowledged and enables the unequivocal and permanent identification of each document in electronic format through the assignment of an alphanumeric code to that document by the publisher.

Each DOI Code includes a prefix and a suffix.

The *prefix* univocally identifies the publisher of a publication; it is assigned by either a national DOI Agency or by the International DOI Foundation. The DOI prefix which the International Foundation assigned to the SIBA Coordination of the University of Lecce is 10.1285/.

The *suffix* is assigned directly by the publisher of a publication. Sometimes it is generated according to a prefixed scheme, even if the standard DOI does not impose any constraint but the uniqueness (that is each DOI code must correspond biunivocally to only one article!). The DOI suffix which SIBA Coordination assigns to its publications is generated according to the following scheme: ISSN+volume+issue+page (Ex. 10.1285/i15900935v21n1p59 = DOI code of the article published in the volume 21 nr 1 of the journal “Note di Matematica” at the page 59).

The REIM System enables to control the access to full-text documents through the authentication of the user by IP address or by password.

The REIM System enables also to consult, through the same Web interface, the electronic journals of other publishers: the System indeed allows also to index the metadata concerning external electronic documents and to refer to the full-text on the relative publisher Web sites.

REIM will be further developed in cooperation with the Unione Matematica Italiana, with the FIZ Karlsruhe and the European Mathematical Society.

The *Italian Editorial Unit of ZMATH* (<http://siba-sinmlimes.unile.it/editZMATH>) was started in 2000 by the SIBA Coordination according to the FIZ Karlsruhe (Berlin),

within the European *LIMES Project (Large Infrastructure Mathematics-Enhanced Services)*.

This Editorial Unit deals with the reviewing of the Italian journals, monographs and proceedings and is actively involved in the development and the updating of ZMATH Database. In order to support the whole Editorial Unit workflow in the most linear, effective and "paperless" manner, SIBA Coordination has designed and developed the LIMES-NAIS (New Advanced Input System). It is a full Web application which supports every step in the editorial unit workflow, including the reviewing process by external reviewers and the data transfer to the ZMATH central production system. NAIS has been designed to allow: a dynamic bibliographic database structure, based upon a *bibliographic database structure definition*; an effective user management, based on the concept of *user roles*; a fully multilingual Web interface for internal (editorial unit staff) and external (reviewers) system users.

NAIS has been built using MySQL 3.23 as SQL database engine and PHP 4.1 as server side scripting engine. PHP scripts generate HTML and Javascript code for the Web user interface, XML data for the XMLRPC interface and the data download interface. The generated Javascript code avoids the use of any browser specific feature, to guarantee, as much as possible, a complete cross browser compatibility.

NAIS is being used by the Italian Editorial Unit for the entire editorial workflow and it has been set up for being used by all European Editorial Units too.

A more detailed description of the objectives and activities of the Italian Editorial Unit of ZMATH is available on the Web site of the same Editorial Unit (<http://siba-sinmlimes.unile.it/editZMATH>) as well as in the paper "The Italian Editorial Unit of ZMATH" by Prof. Carlo Sempi.

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