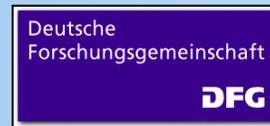




# Math*Diss* International

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**Prof. Dr. Günter Törner**

**Dipl.-Math. Thorsten Bahne**

**Gerhard-Mercator-Universität Duisburg**

**Germany**

# The large spectrum of EDTs... (DDC)

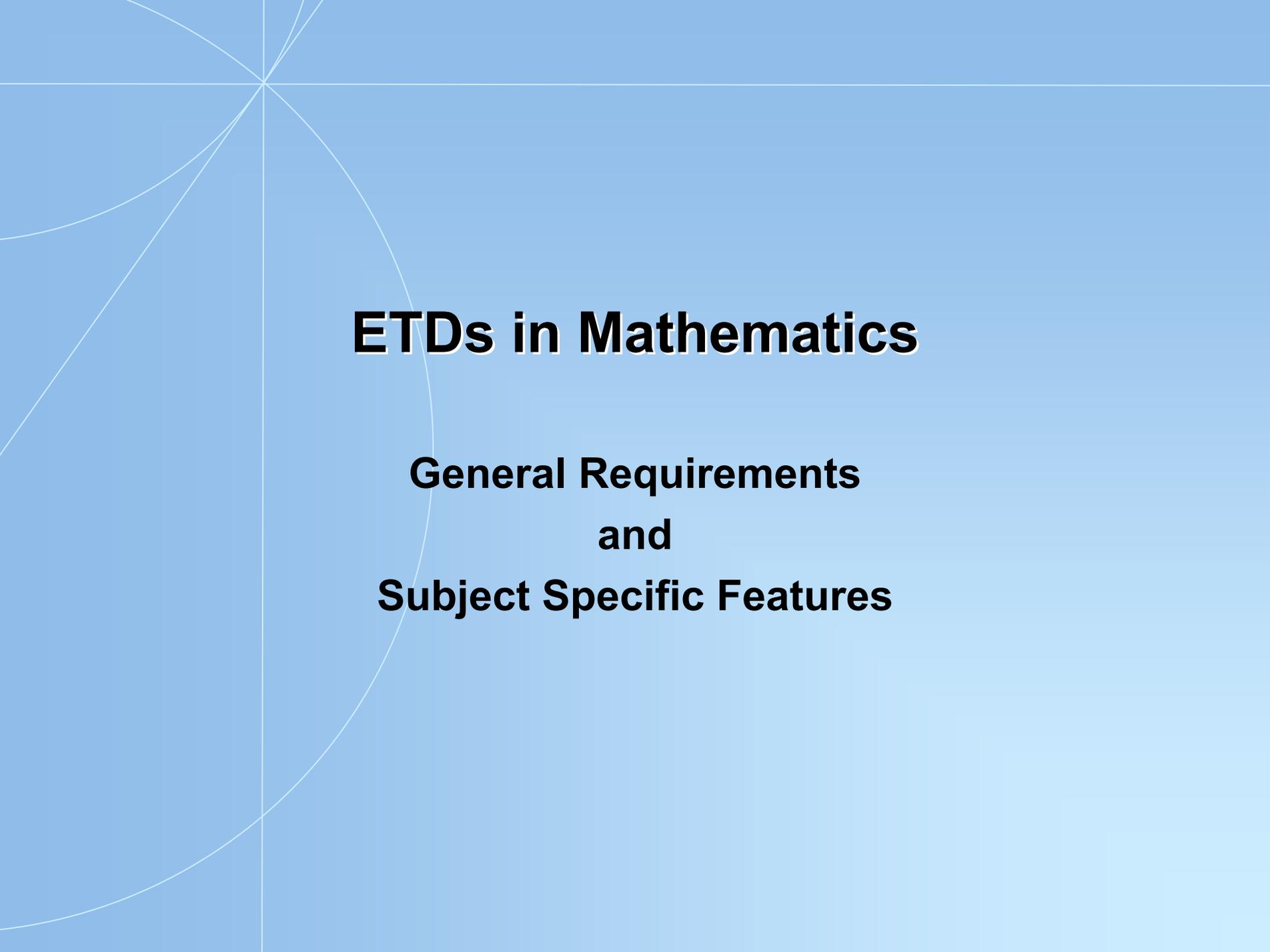
- **Philosophy**
  - **Religion**
  - **Social Sciences**
  - **Languages**
  - **Pure Sciences**
  - **Applied Sciences & Technology**
  - **Arts**
  - **Literature**
  - **History & Geography**
  - **General**
- 
- Math
  - Astronomy
  - Physics
  - Chemistry
  - Earth Science
  - Paleontology
  - Life Sciences
  - Botany
  - Zoology

**ETDs in different disciplines require  
different solutions**



**hence establish  
the Subject Specific Services  
(SSS)**





# **ETDs in Mathematics**

**General Requirements  
and  
Subject Specific Features**

# Mathematics ... as a well-organized bibliographical subject

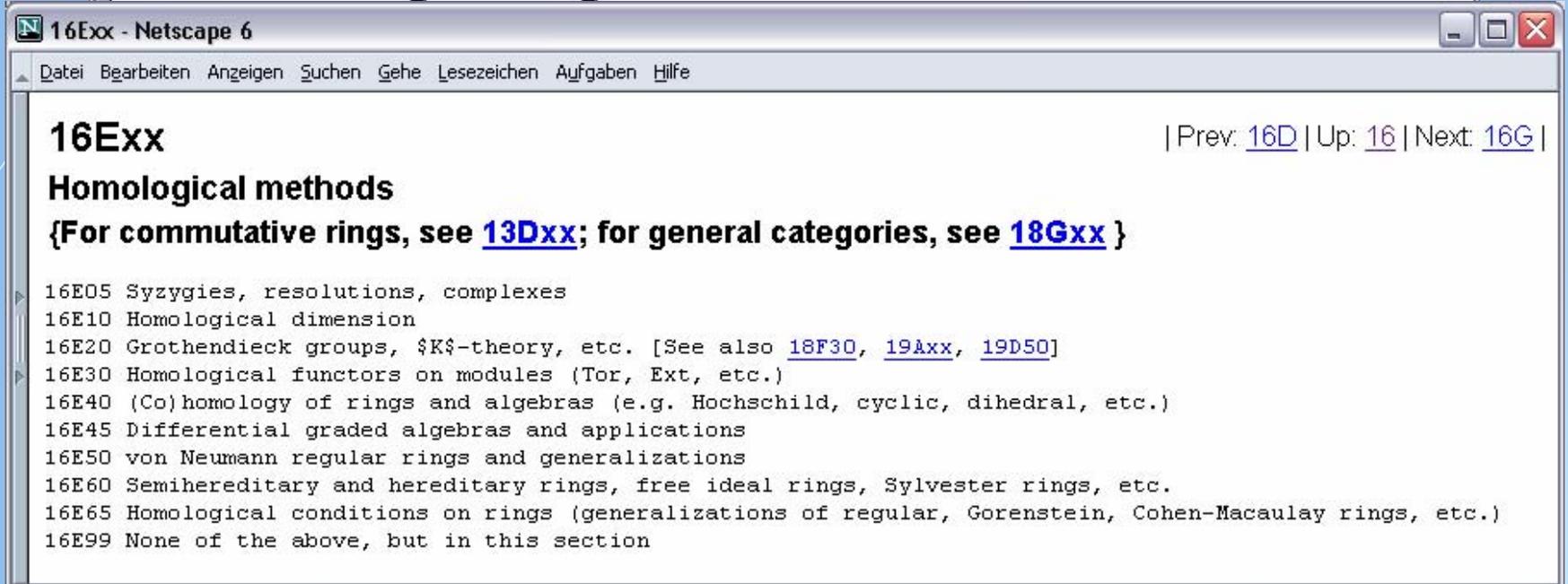
There exist three independent databases covering a major part of mathematical literature  
(more than 30.000 new articles per year)

- Mathematical Reviews - MR  
(run by American Mathematical Society - AMS)  
Online database
- Zentralblatt für Mathematik – Zentralblatt MATH  
(run by European Mathematical Society - EMS)  
Online database
- Russian Reviewing Journal (Izvestija Mathematics )

# Mathematics ... as a research discipline

- There exists a world-wide accepted classification system:  
*MSC – Mathematical Subject Classification*
- MSC is continuously updated by the International Mathematical Union (IMU), the international panel for all learned societies of mathematics; actual version MSC 2000.
- MSC identifies nearly 80 subdisciplines within math; each subdiscipline itself is then covered by a further three-steps-classification system using digits and letters.
- MSC provides the scientists with a large list of keywords.

# MSC



[16Fxx](#) Rings with polynomial identity

[16Sxx](#) Rings and algebras arising under various constructions

[16Uxx](#) Conditions on elements

[16Wxx](#) Rings and algebras with additional structure

[16Yxx](#) Generalizations {For nonassociative rings, see [17-XX](#)}

16Z05 Computational aspects of associative rings [See also [68W30](#)]

# format problem

- TeX and LaTeX as an answer to the format problem
- LaTeX History
  - First Development in the seventies
  - First versions of TeX in 1984-86 by Donald Knuth.
    - Plain TeX:
      - Knuth's basic format (basis of every other format).
  - LaTeX:
    - Lamport's format for higher-level commands to producing complex documents (1985).
    - Latest version is 2.09 in 1992.
  - LaTeX2e:
    - Beta version to LaTeX3 in 1994 (really standard version).
    - LaTeX 3 under development

# Problems around the format question

- MathML solves the format as well as the archive problem by converting into XML completely, however...
- Using MS Word together with MathType 5.0 solves the Markup in a satisfactory way, however...
- Any converting of MS Word into MathML means a loss of semantic information.
- This loss of information could only be reversed manually, not automatically.

## MarkUp

LaTeX

$$1_A(x) := \begin{cases} 1, & \text{if } x \in A \\ 0, & \text{else} \end{cases}$$

MS Word

$$1_A(x) := \begin{cases} 1, & \text{if } x \in A \\ 0, & \text{else} \end{cases}$$

# LaTeX-Code (original)

```
\begin{eqnarray*}
  1_{A}(x) := \begin{cases}
    1, & \text{if } x \in A \\
    0, & \text{else }
  \end{cases} \\
\end{eqnarray*}
```

# converter (AMS-LaTeX)

\$\$

$1_A(x) := \left\{ \begin{array}{l} 1, \text{ if } x \in A \\ 0, \text{ else} \end{array} \right.$

$\left. \begin{array}{l} \text{if } x \in A \\ \text{else} \end{array} \right\}$

$\left. \begin{array}{l} \text{if } x \in A \\ \text{else} \end{array} \right\}$

$\left. \begin{array}{l} \text{if } x \in A \\ \text{else} \end{array} \right\}$

\$\$

# converter LaTeX 2.09 or later

\$\$

```
1_A (x): = \left\{ \begin{array}{l} 1, \{\rm{ if }} x \in A \\ 0, \{\rm{ else }} \end{array} \right.
```

\$\$

# MathML-Code

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  </mrow>
</math>
<!-- MathType@End@5@5@ -->
```



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International Server for  
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in Mathematics

A project at the  
GMU Duisburg



In cooperation with the  
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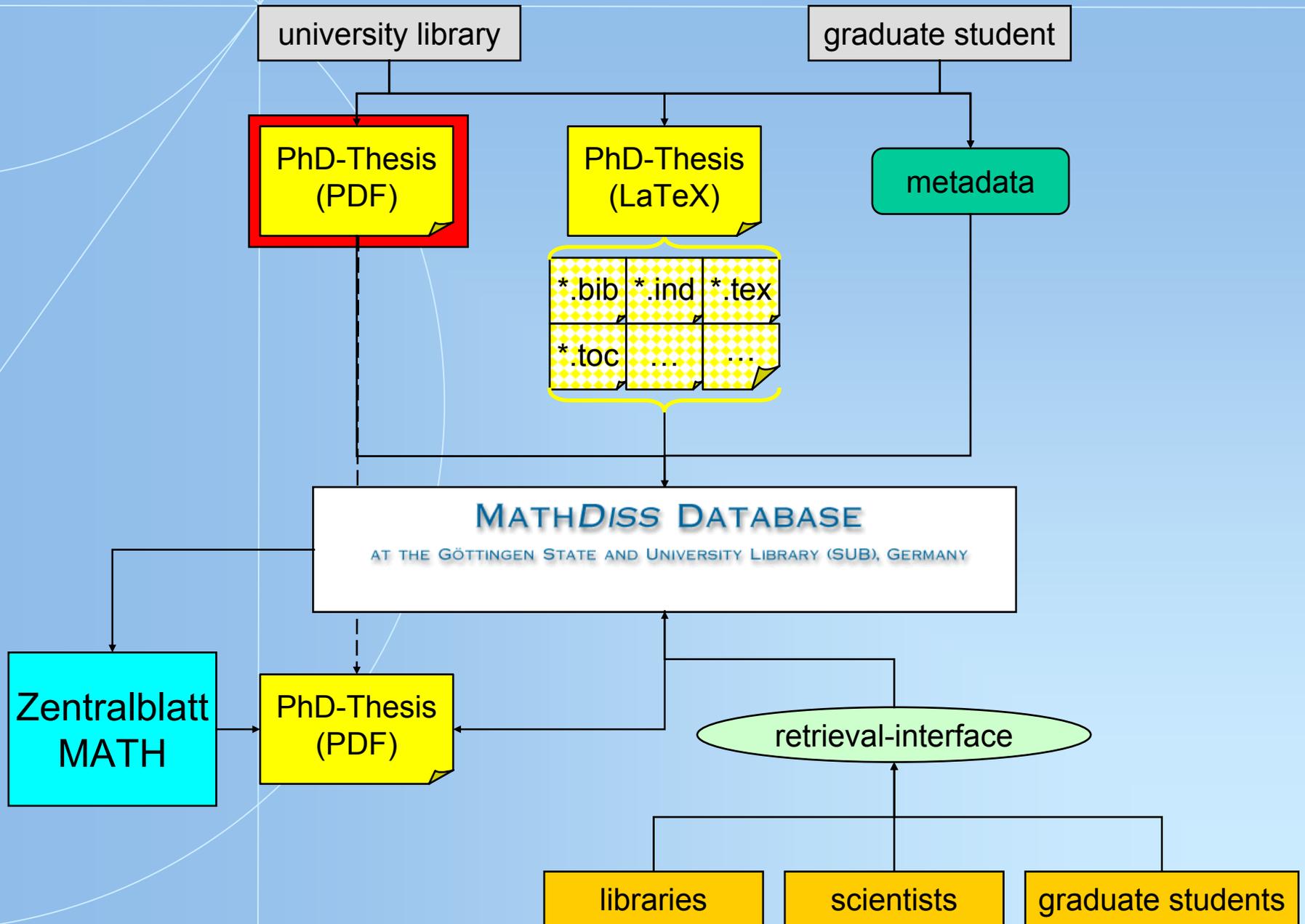
Deutsche  
Forschungsgemeinschaft

DFG

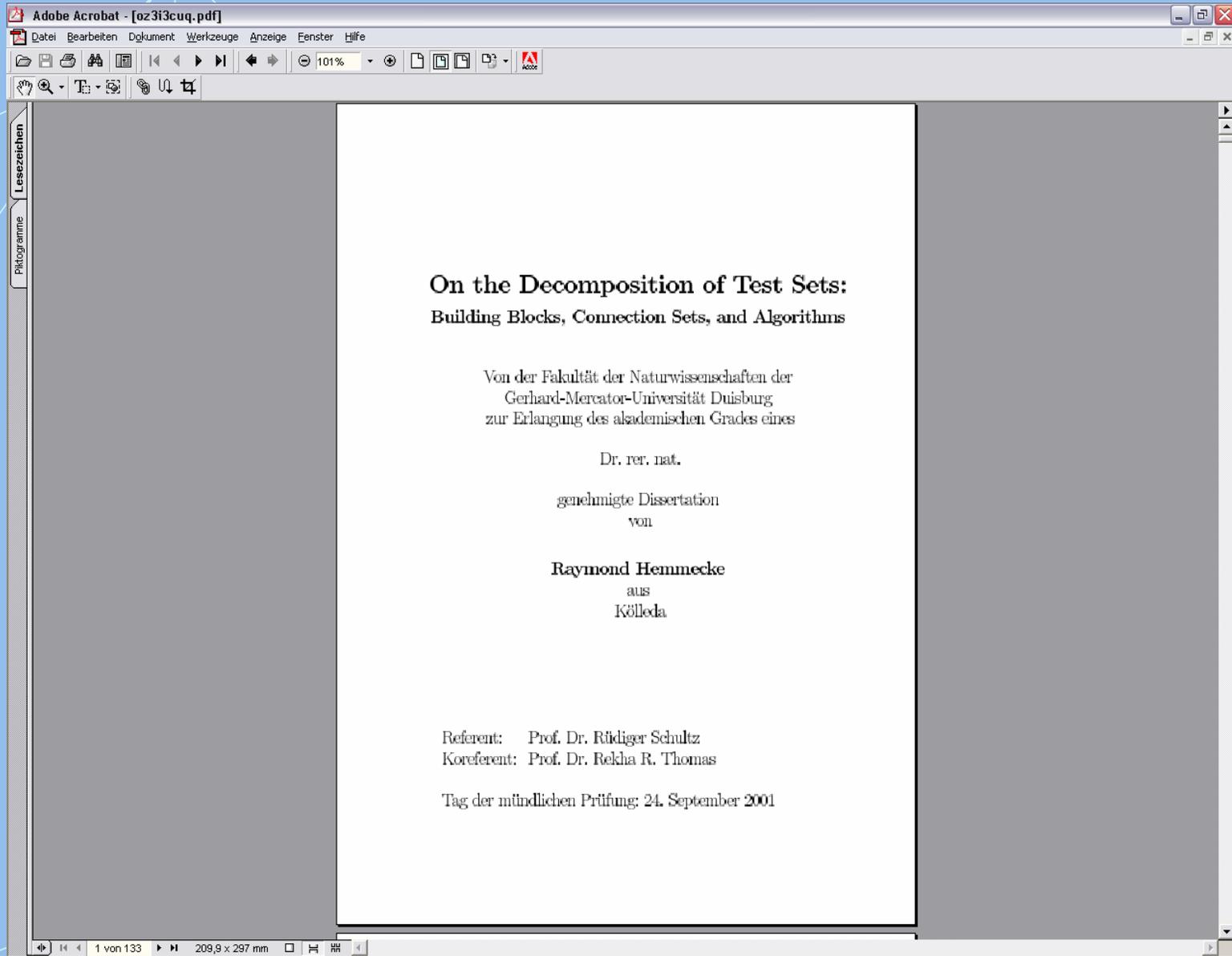
# Objectives of MathDiss International

- To establish a subject specific server at the Goettingen State and University Library (SUB).
- To provide future service for Math-Net
- To develop format homogeneous solutions
- To combine Metadata and Meta-Information in accordance to
  - Dissertation Online (German National Library)
  - NDLTD
- To integrate TeX / LaTeX-functions for gaining retrieval data

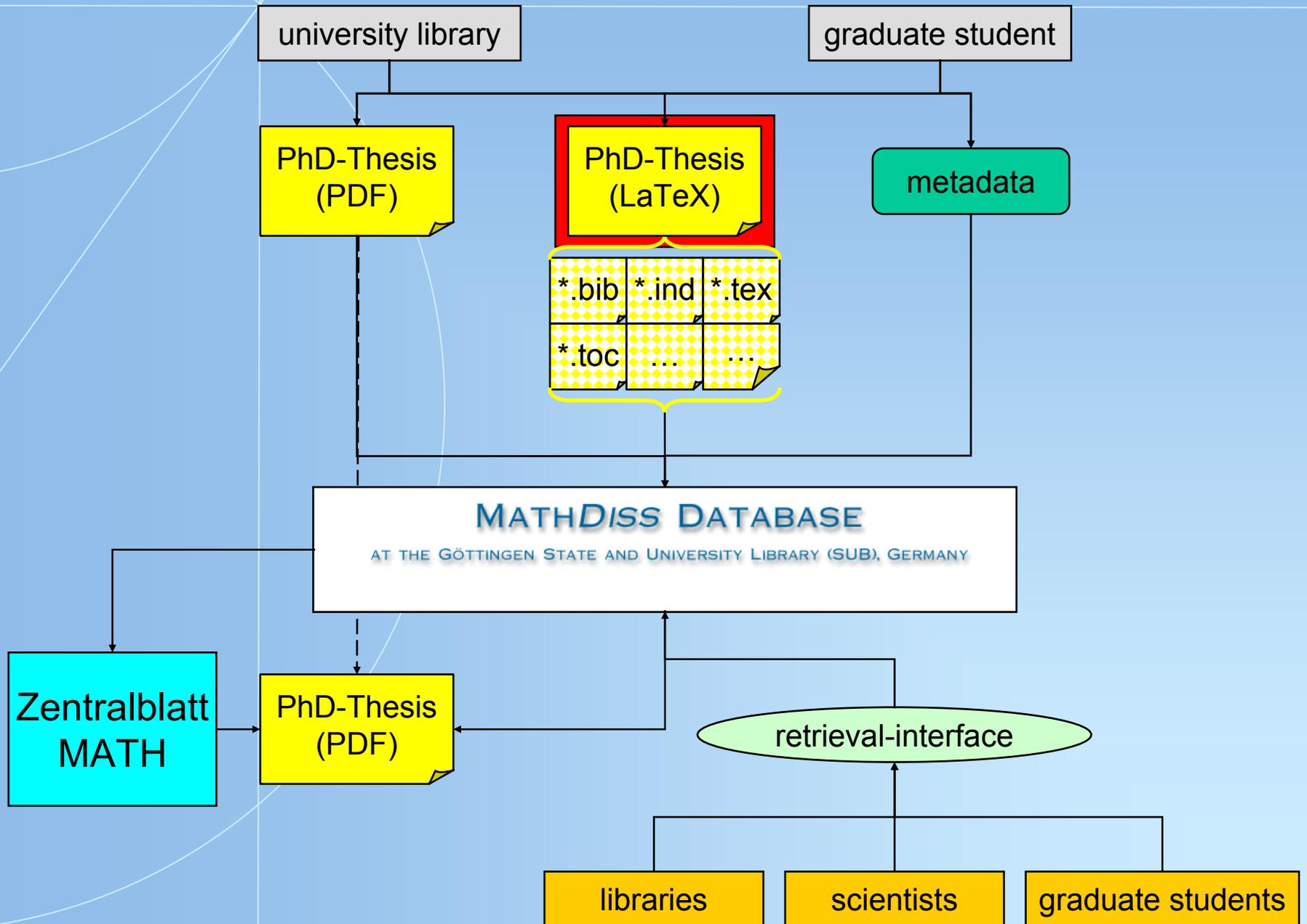
# Workflow



# PhD-Thesis (PDF)



# Workflow



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Datei Bearbeiten Suchen Ansicht Einfügen Mathe Format Projekt Ausgabe Extras Fenster ?

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\item Erwartung
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  \subitem gleichm\ "a}{\ss}ig integrierbares \dotfill 82
\item Ma{\ss}
  \subitem orthogonales \dotfill 18
\item Menge
  \subitem invariante \dotfill 3, 11|
  \subitem permutierbare \dotfill 4
  \subitem symmetrische \dotfill 4
  \subitem terminale \dotfill 3
\item Modulo-Abbildung \dotfill 93

\indexspace

\item Permutation
  \subitem endliche \dotfill 3
\item Prozess
  \subitem *-mischender \dotfill 53
  \subitem 2-vertauschbar im zweiten Moment \dotfill 50
  \subitem 2-vertauschbarer \dotfill 50

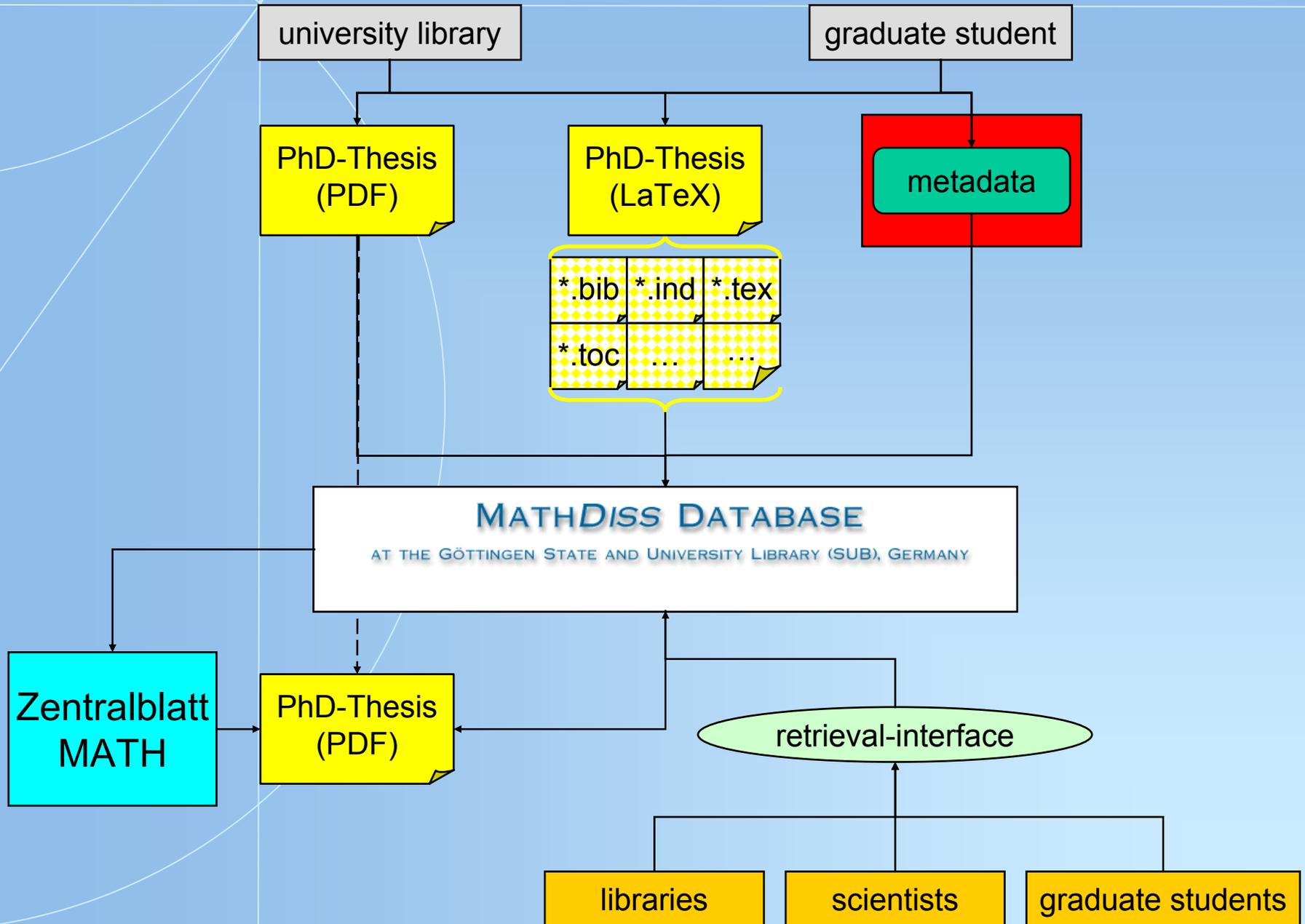
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Datei Bearbeiten Suchen Ansicht Einfügen Mathe Format Projekt Ausgabe Extras Fenster ?

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\contentsline {section}{\hbox to \@tempdima {2.3\hfil }}{Definition: Invariante, terminale und
symmetrische Menge}{6}
\contentsline {section}{\hbox to \@tempdima {2.4\hfil }}{Definition: Shift-Operator}{7}
\contentsline {section}{\hbox to \@tempdima {2.5\hfil }}{Definition: Invariante, terminale und
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\contentsline {section}{\hbox to \@tempdima {2.8\hfil }}{Definition: Ergodischer
Proze{\ss}}{10}
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Ergodizit\u{a}t und me{\ss}bare Funktionen}{19}
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bare Funktionen}{20}
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Ergodizit\u{a}t}{23}
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bez\u{u}glich zweier Ma{\ss}e}{24}
\contentsline {section}{\hbox to \@tempdima {3.11\hfil }}{Abgeschlossenheit von schwach
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# Workflow



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## My Meta Maker for Theses (RDF)

*Information on the expected input format is given through the hyperlinks. Optional fields are marked by (\*).*

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[Date of Birth: \(\\*\)](#)  [Place of Birth: \(\\*\)](#)

[Street Address: \(\\*\)](#)

[Postal Code: \(\\*\)](#)  [City: \(\\*\)](#)

[Country: \(\\*\)](#)

[E-Mail: \(\\*\)](#)

[Homepage: \(\\*\)](#)

### Information on the thesis

[Title of the thesis in](#)   :

[Subtitle of the thesis: \(\\*\)](#)

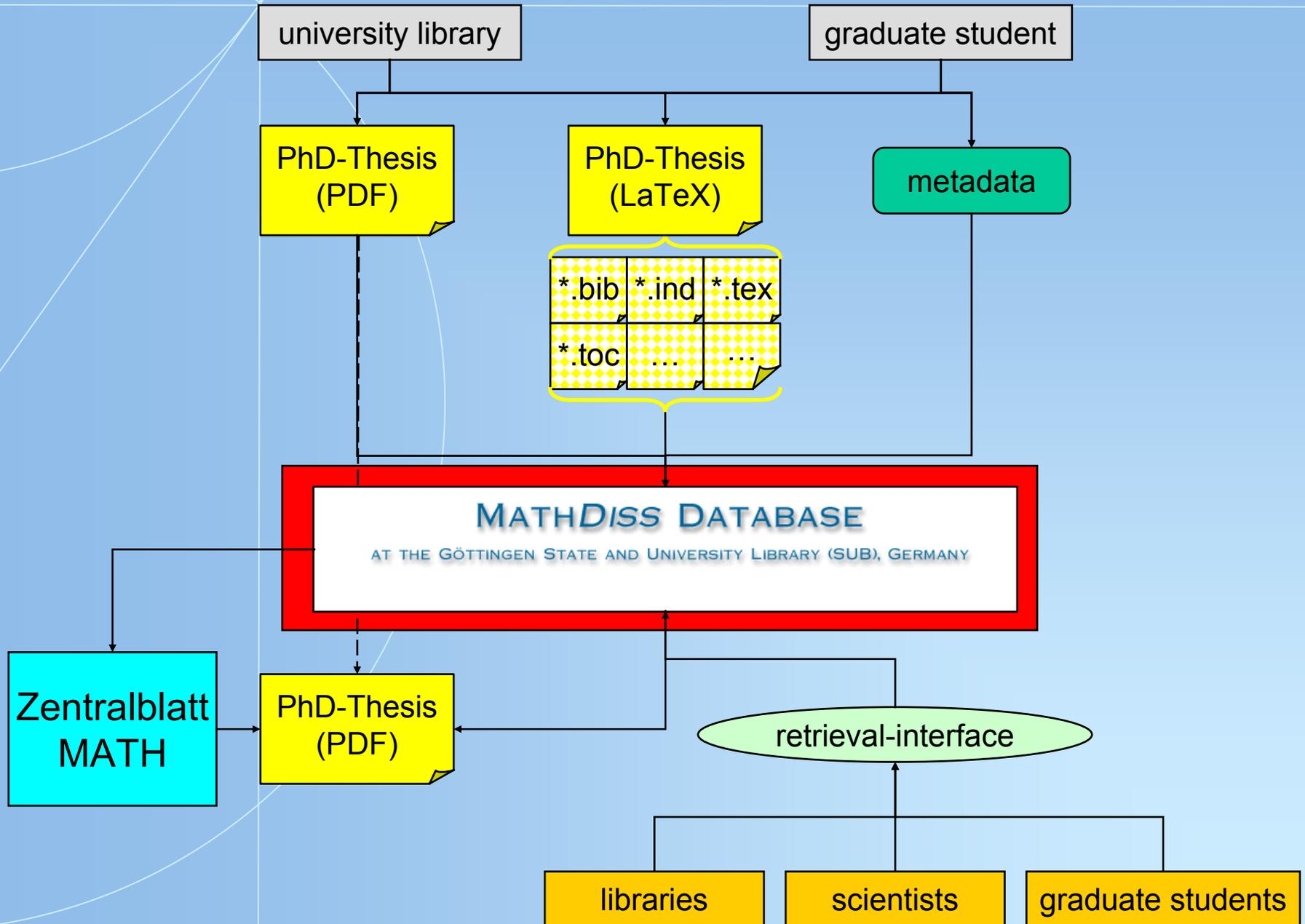
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# Workflow



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SEARCH ENGINE

---

**Advanced Search**

Category:  Word(s):

Category:  Word(s):

Category:  Word(s):

Display:  Sort:

There is also a  table.

**Notes:**

- ◆ This service can only be used from a forms-capable browser.
- ◆ To search in the categories **Subject Class**, **Language** and **Country** you have to enter the respective abbreviations.
- ◆ Except for Keywords you can use the Booleans **and**, **or** and **not**. Without these Booleans a search with **and** will be performed.
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**GMU Duisburg  
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MathGuide**

#00 000104  
#10 \*On\* Enumeration of chord diagrams and asymptotics of Vassiliev invariants\$Sen  
#21 http://darwin.inf.fu-berlin.de/1999/21/\$mtext/html  
#21ahttp://www.sub.uni-goettingen.de/ssgf/mathdiss/archive/stoimenow.zip\$mapplication/zip  
#25 en  
#30 27  
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#32a57M25  
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#99e20020403  
#33 Der Gegenstand dieser Arbeit ist die Kombinatorik von Sehnendiagrammen und Asymptotik von Vassiliev-Invarianten. In den Abschnitten 2 und 3 werden wir e  
#34 The subject of the present thesis are combinatorics of chord diagrams and asymptotics of Vassiliev invariants. In sections 2 and 3 we will derive some (purely)

Edit Formatted Display

- [Create new record](#)
- [Hints for usage](#)
- [Log in to another data base](#)

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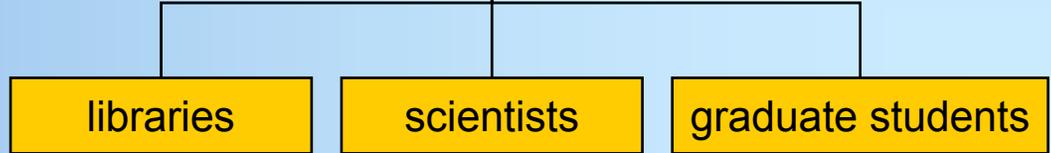
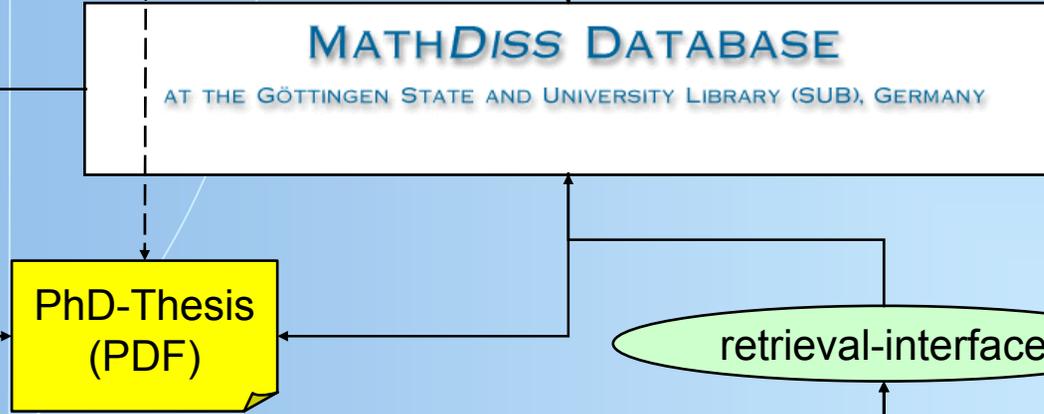
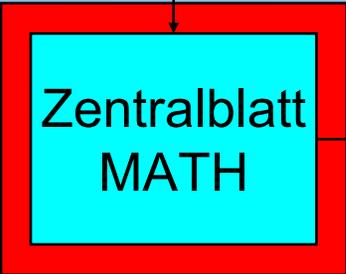
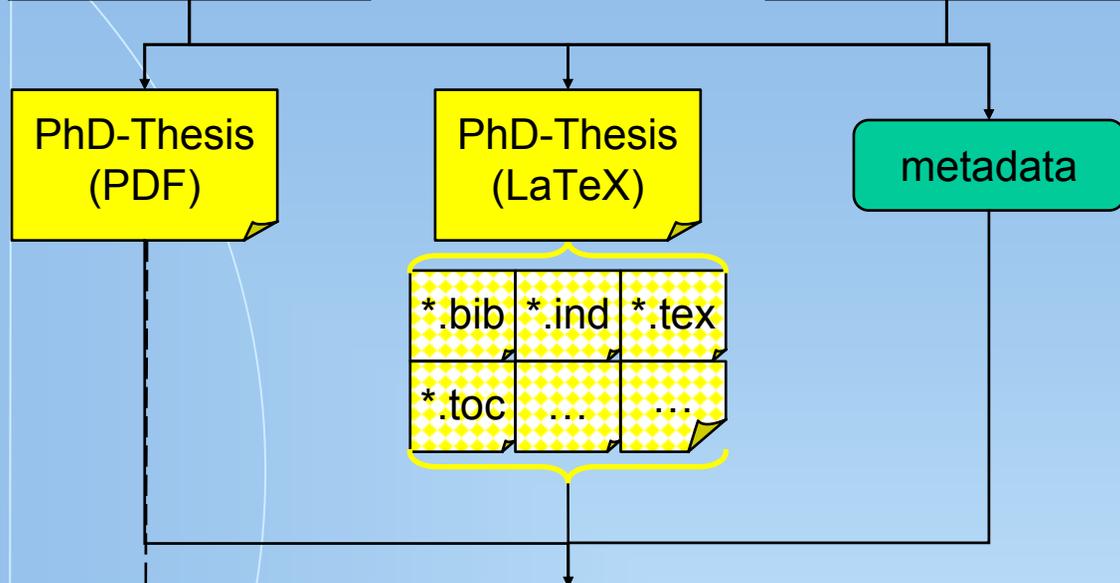
With respect to the contents of the database: With respect to technical questions:

Hans-Jürgen Becker Thomas Fischer  
([becker@mail.sub.uni-goettingen.de](mailto:becker@mail.sub.uni-goettingen.de)) ([fischer@mail.sub.uni-goettingen.de](mailto:fischer@mail.sub.uni-goettingen.de))  
Tel. (+49) 0551-39-5230 Tel. (+49) 0551-39-3883

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Dokument fertig (0,891 Sek.)

# Workflow





Your query: an = (0978.05077)

### Answers 1-1 (of 1)

0978.05077

[Heinze, Aiso](#)

**Applications of Schur rings in algebraic combinatorics: graphs, partial difference sets and cyclotomic schemes.** (English)

[B, D] Oldenburg: Univ. Oldenburg, Department of Mathematics, 189 p. (2001).

The concept of Schur rings was introduced in 1933 by I. Schur. For several decades applications of Schur rings were restricted to the investigation of permutation groups. Starting in the fifties, similar concepts like association schemes, cellular algebras and coherent configurations were introduced independently by different authors. They were used for various questions in algebraic combinatorics and statistics. In this thesis three different tasks which are related to these concepts are considered: (1) characterization of commuting graphs, (2) consideration of strongly regular graphs and partial difference sets, and (3) investigation of cyclotomic schemes. The first part deals with graphs with commuting adjacency matrices. Here, we give results for commuting regular graphs and discuss the case of non-regular graphs. The second part deals with the construction of partial difference sets by using strongly regular Cayley graphs. Theoretical and computational approaches are discussed and all regular partial difference sets in groups up to order 49 are determined. Moreover, regular partial difference sets for strongly regular graphs up to 255 vertices which have primitive automorphism group, are constructed. In the third part an algorithm for the determination of cellular subrings of cellular rings is adopted for cyclotomic schemes. This algorithm uses the information given by cyclotomic numbers for the complete theoretical determination of all subschemes. The determination of subschemes for cyclotomic schemes with three, four and six classes is described in detail.

[ [Aiso Heinze \(Oldenburg\)](#) ]

MSC 2000:

\*[05E30](#) Association schemes, etc.

[05B10](#) Difference sets

[11T22](#) Cyclotomy

[20B25](#) Finite automorphism groups of miscellaneous structures

[05C25](#) Graphs and groups

[05C50](#) Graphs and matrices

[68R10](#) Graph theory in connection with computer science

*Keywords:* Schur rings; association schemes; cellular algebras; coherent configurations; strongly regular graphs; partial difference sets; cyclotomic schemes; adjacency matrices; Cayley graphs; automorphism group; subschemes

[Cited in Zbl. reviews...](#)



Link to full text

On line ordering services

[\[New query form\]](#)

### Answers 1-1 (of 1)

Zentralblatt MATH ([E-Mail](#)).

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- Cooperation with ETH Zurich
- Cooperation with Helsinki University of Technology
- Cooperation with Koordinationsstelle Dissertation Online (DDB)
- ...

# Further Information

- **Project Homepage**

<http://www.mathetd.info>

- **Email**

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