PROF. PARTHA PRATIM DAS
ppd@cse.iitkgp.ernet.in
Joint PI, NDL Project, NME-ICT, MHRD
Indian Institute of Technology Kharagpur

WINNER mBillionth South Asia Award 2017:
in Learning and Education Category
for Android Mobile App
NDL Vision

BUILD UP
NATIONAL DIGITAL LIBRARY OF INDIA
AS A NATIONAL KNOWLEDGE ASSET –

THE KEY DRIVING FORCE FOR EDUCATION, RESEARCH, INNOVATION, AND KNOWLEDGE ECONOMY IN INDIA
NDL Mission

TO CREATE A 24X7-ENABLED INTEGRATED NDL AS A UBIQUITOUS DIGITAL KNOWLEDGE SOURCE OF THE NATION – CATERING TO IMMERSIVE E-LEARNING FOR ALL LEARNERS AT ALL LEVELS IN ALL AREAS

TO INITIATE A MOVEMENT FOR INTEGRATED DIGITAL LEARNING ACROSS INDIA
NDL Motto

INCLUSIVE & OPEN
National Digital Library of India

Issues, Architecture And Use Models

Libraries are more important to the education system than the institutions such as schools, colleges and universities

– Rabindranath Tagore
National Digital Library: Issues

User-side

- Wide geographic expanse & Large population
- Huge number of students
- Large number of institutions
- Varied linguistic diversity
- Severe lack of Teachers

Provider-side

- Wealth of digital content
  - Books and Articles
  - ETD
  - Question Papers and Solutions
  - Video Lectures - MOOCs
  - Simulations & Animations
  - NMEICT Projects
  - Data
  - ...

- No single-window search
- Google search uses keyword – no metadata search
- Widely varied DL technology
- Lack of Interactivity, Vernacular support
- Low integration between content and learning system
- Weak ecosystem between learners and teachers
National Digital Library: Service Architecture

- Content Creation
- Content Search
- Learning Content
- Experience-based Learning
- Multi-Lingual Content
- Mobile Apps
- Authoring Services
- Acquisition Services
- Digital Repository
- Dissemination Services
- Learning Services
- Personalization Services
- Localization Services
- Open Services...
- National Digital Library
- Content Borrowing
- Content Access
- Multi-faceted Interface
- APIs

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Use Models

Physically Challenged

Researchers

Learners

Professionals

Content Access

Content Contribution

Contributing Institutions

Institutional Digital Repositories

Web Content Harvesting

Web Content

NDL Repository

Learning Management System

Educators

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Presentation Model

- Not a new library – an umbrella
- Collects and ingests metadata only
- Presents full-text from source view
- Provides:
  - Search
  - Browse
Objective and Scope

TARGETS
CONTENTS, STAKEHOLDERS, CONTRIBUTORS, USERS, ARCHITECTURE, AND THE BIG PICTURE

S R Ranganathan Laws
- Books are for use
- Every reader his [or her] book
- Every book its reader
- Save the time of the reader
- The library is a growing organism
Objectives

- A 24X7-enabled Infrastructure for NDLI with single window search facility – To include h/w systems, n/w, s/w tools, applications and interoperability
- Harvest IDR(s) across institutions of the nation to provide integrated access
- Facilitate select institutes to disseminate existing content and create new digital content
- Immersive E-learning environments at multiple levels spanning across
  - All academic levels – school to life-long learning
  - All disciplines – Science, Arts, Engineering, Medical, Law, and
  - All languages – used as medium of instruction.
- Interfaces in Indian Languages & for DA
Digital Contents

Digital, Surrogate
Digital, Metadata
Digital, etc.

- Born-digital object
- Digital surrogate of a physical object
- Digital metadata of a physical object

Metadata at NDL

- NDL does not store contents
- NDL only ingests metadata for Search & Browse
- Content (Full-text) is delivered from Source

A content is included (metadata ingested) in NDL if it is expected to have educational value
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Institutional Digital Repository of Contributing Institutes

Range of Contents

- Faculty Publications, ETD (Electronic Thesis & Dissertation): DSc-PhD-Masters-Undergrad, Research Projects
- Books & Periodicals, Open Access Journals, E-Books & Subscribed E-Resource
- Annual Reports, Project Reports, Convocation, Working Papers, Others
- Encyclopaedia Dictionaries Directories Others
- Lecture Slides, Videos, Class Notes, Courseware
- Term Papers, Assignments, Solutions
- Lab Experiments, Manuals, Case Studies
- Question Banks (JEE/GATE/NET/CAT), Model Answers
- Research and Professional Institutions, Central / State University
- Institutions of School & Higher Education, Boards
- Institutional and Open Contributions. Multi-modal, Multi-faceted
- Datasets, Benchmarks, Models, Maps, Software
- Manuscripts, Painting, Sculpture, Music, Dance, Drama
- Audio & Video Content

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Content View Architecture

Vertical-Specific Custom Interface and Search

Domain Specific
- School Vertical
- Domain Vertical (Medical/Legal/...)
- Competitive Exam Vertical
- Data Vertical
- Application Vertical

Domain Metadata

MCQ/MSQ/...

Textbook, Lesson View

App Launcher

Content Baseline

Search

Generic Interface and Search
## Stakeholders

### Roles and Responsibilities

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Roles and Responsibility</th>
</tr>
</thead>
</table>
| **Government** | 1. Sponsor and facilitator  
2. Content Contributor  
   - Ministries / Departments  
   - R & D Labs |
| **Institutions** | 1. Host Institution – IIT Kharagpur  
2. Contributing Institution – Supporting IDRns  
3. Participating Institution – Providing Users & Feedback |
| **Public** | 1. Use and Feedback  
2. Metadata by Crowd Sourcing  
3. Content by Crowd Sourcing |
| **Industry** | 1. Technology Providers |
| **Publishers** | 1. Metadata Provider  
2. Content Provider (under various licensing schemes) |
Users & Access

Individual

- Registration is Open to all

Registration Types:

- **Individual**
  - Registers directly

- **Institutional**
  - By request from Institution
  - Managed by authenticated Nodal Person
  - Convenient for bulk upload of users

NDL Users

- School
- College
- Professional
- Life-long Learner

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Architecture

- **Index Management**
  - Ingestion of Metadata
  - Indexing of Metadata for Search

- **Content Management**
  - Dissemination of local contents

- **Learning Management**
  - Creation of Content
  - Handling learning interactions
The Big Picture

Knowledge Repository: Internet, Mobile

National Digital Library of India

SWAYAM, SWAYAM Prabha, GIAN

Credit Transfer and Virtual Certification (NAD)

School, Certificate, Diploma, UG & PG: Internet

SWAYAM: instrument for self-actualisation

SWAYAM Prabha: 32 DTH, 24x7

School, UG, PG, Open U, IIT PAL: TV – DTH

National Digital Initiative in Education
Walkthrough

Where the mind is without fear and the head is held high
Where knowledge is free
Where the world has not been broken up into fragments
By narrow domestic walls
Where words come out from the depth of truth
Where tireless striving stretches its arms towards perfection
Where the clear stream of reason has not lost its way
Into the dreary desert sand of dead habit
Where the mind is led forward by thee
Into ever-widening thought and action
Into that heaven of freedom, my Father, let my country awake.

– Rabindranath Tagore
Landing Page

National Digital Library of India

18,245,269 items hosted in NDL India

Enter your search key...

English

About NDL India
Learning Resource Type
Subject Domain
Featured Sources
News and Events

Educational materials are available for users ranging from primary to post-graduate levels

Member Log-In

E-mail address

Enter your password

141862

Enter the displayed text

Remember me

Log In

Account recovery

Register

Institutional Registration

NDL India Video YouTube Link

Feedback

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Refine Search (Author) Page

130 results found in 0.2500 secs

Transport, magnetic, and Sn119 Mossbauer studies on magnetically ordered valence fluctuating compound SmRuSb

Author: Gupt, L. C.

Source: IIT Bombay

Abstract: SmRuSb is a unique compound among the known Sm-based valence fluctuation (VF) systems. Its crystallographic structure has two inequivalent Sm sites and Sm ions at only one of them are in VF state while View more

Double Magnetic Transition And Anomalous Magnetoresistance In ErSUB2 SUBNiSUB3 SUBSiSUB5 SUB

Author: Mazumdar, Chandan | Nagarajan, R. | Nigam, A. | Godart, C.

Source: Indian Academy of Sciences

Abstract: Synthesis and magnetic properties of a new material ErSUB2 SUBNiSUB3 SUBSiSUB5 SUB, are reported here. This compound exhibits a double magnetic transition (TSUBm SUB~4K and 3K) as revealed by heat ca View more

Magnetic Properties Of RNiSUB2 SUBBSUB2 SUBC (R=Pr, Sm, Dy And Tb)

Author: Hoff, Z. | Dhar, S. K. | Nagarajan, R. | Gupt, L.

Source: Indian Academy of Sciences

Research | UG and PG

Abstract: We report here the results of magnetization and heat capacity measurements on RNiSUB2 SUBBSUB2 SUBC (R=Pr, Sm, Dy and Tb). Sm, Dy and Tb compounds order magnetically at 10 K, 11 K and 18 K respectively View more

Valence Instability In Eu(PdSUB1-x SUBAuSUBx SUB)SUB2 SUBSiSUB2 SUB: The Global Phase Diagram

Author: Segre, B. U. | Croft, M. | Hodges, J. A. | Murgai, V.

Source: Indian Academy of Sciences

Research | UG and PG

Abstract: A system has been discovered in which the characteristic energies of a valence instability and a magnetic ordering instability can be brought into parity. This leads to a novel phase diagram where a View more
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Institutional repository of IIT Bombay is a research produced at IITB. Here we present a selection of our best research including full-text of book chapters, conference/proceeding papers, technical reports, journal pre-prints & post-prints, working papers, Patents and others like annual reports etc.

Email: dspace@iitb.ac.in

DSpace at IIT Bombay / IITB Publications / Proceedings papers

Please use this identifier to cite or link to this item: http://dspace.library.iitb.ac.in/xmlui/handle/1000/1441

Title: Transport, magnetic, and Sn-119 Mossbauer studies on magnetically ordered valence fluctuating compound SmRuSn3

Authors: MAZUMDAR, C
HOSSAIN, Z
NAGARAJAN, R
GODART, C
DHAR, SK
GUPTA, LC
PADALIA, BD
Transport, magnetic, and Sn-119 Mossbauer studies on magnetically ordered valence fluctuating compound SmRuSn3

Author

Source
IIT Bombay

Content type
Text

Publisher
AMER INST PHYSICS

File Format
HTM / HTML

Language
English

Subject Keyword
cerusn3

Abstract
SmRuSn3 is a unique compound among the known Sm-based valence fluctuation (VF) systems. Its crystallographic structure has two inequivalent Sm sites and Sm ions at only one of them are in VF state while the Sm ions in the other site orders magnetically. Our (119)Mossbauer studies show a quadrupolar splitting at the Sn site, consistent with the noncubic symmetry of the Sn site. A broadening of the Mossbauer spectrum is seen due to magnetic ordering of the material. The transferred hyperfine field at Sn site at 4.2 K is small. (c) 1996 American Institute of Physics.

Education Level
UG and PG

Learning Resource Type
Article
Transport, magnetic, and $^{119}\text{Sn}$ Mössbauer studies on magnetically ordered valence fluctuating compound SmRuSn$_3$


Citation: J. Appl. Phys. 79, 6349 (1996); doi: 10.1063/1.361996
View online: http://dx.doi.org/10.1063/1.361996
View Table of Contents: http://jap.aip.org/resource/1/JAPIAU/v79/i8
Published by the American Institute of Physics.

Related Articles
Valence fluctuation and electron–phonon coupling in La$_{66-x}$Ce$_x$Al$_{10}$Cu$_{20}$Co$_2$ ($x = 0, 34$, and $68$) metallic glasses
Intermediate valency of Eu in a cubic intermetallic compound Ce$_{0.5}$Eu$_{0.5}$Pd$_3$
Refine Search (Educational Level) Page

magnetism

741 results found in 0.2133 secs

MAGNETICS

Source: StemEZ
Self Learning | Problem Solving | Reading | Assessment
| IX and X | XI and XII

PROBLEM 21 - 0722: Magnetic Forces - MAGNETICS

Source: StemEZ
Self Learning | Problem Solving | Reading | Assessment
| IX and X | XI and XII

PROBLEM 21 - 0725: Magnetic Forces - MAGNETICS

Source: StemEZ
Self Learning | Problem Solving | Reading | Assessment
| IX and X | XI and XII

PROBLEM 21 - 0728: Magnetic Forces - MAGNETICS

Source: StemEZ
Self Learning | Problem Solving | Reading | Assessment
| IX and X | XI and XII

Select Educational Level:

- UG and PG
- Career/Technical...
- XI and XII
- IX and X
- V to VIII
- I to IV
Refine Search (Source) Page

![Search Engine Interface]

- **Source**: NCERT
- **Subject Category**: Magnetism
- **Content Type**: Text

**Magnetism and Matter**
- Source: NCERT
- Abstract: This chapter contains problems on magnetism and matter. The content consists of various questions about the chapter. The questions are divided into three parts: A) Multiple choice questions, B) Short View more

**Moving Charges and Magnetism**
- Source: NCERT
- Abstract: This chapter introduces the concept magnetic force, motion in a magnetic field, motion in combined electric and magnetic fields. It deals with Biot-Savart Law, Ampere's circuit law.

**Fun with Magnets**
- Source: NCERT
- Abstract: This chapter describes types of materials, how magnets were discovered. It also deals with the classification of material on the basis of magnetic property and its behavior.

**Magnetism and Matter**
- Source: NCERT
- Abstract: This chapter introduces the bar magnet, magnetism and Gauss's law. It also includes magnetic properties of materials and permanent magnets and electromagnets.
Chapter Five
MAGNETISM AND MATTER
Search Filter Page (Video)
Browse (by Type) Page

- TRB Examination Coaching Class
  - Source: Bharathidasan University
  - Author: Srinivasaragavan, S.
  - UG and PG

- Dr. K. Meena Deliver the Speech on Independence Day
  - Source: Bharathidasan University
  - Author: Meena, K.
  - UG and PG

- Independence Day
  - Source: Bharathidasan University
  - Author: Ponnavaikko, M.
  - UG and PG

- Sellalaur Ranganathanin Research Publication Inauguration Day
  - Source: Bharathidasan University
  - Author: Ponnavaikko, M.
  - UG and PG
<table>
<thead>
<tr>
<th>Title</th>
<th>Source</th>
<th>Abstract</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total graph and its characteristics</td>
<td>Dhirubhai Ambani Institute of Information</td>
<td>Abstract: Graphs constructed by applying some specific rule to any given</td>
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<td></td>
<td>and Communication Project</td>
<td>graph are called auxiliary graphs. Such graphs are often used to translate</td>
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<td>one graph problem into another. Auxiliary graphs can be viewed View</td>
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<td>Counting spanning binary trees of labelled</td>
<td>Dhirubhai Ambani Institute of Information</td>
<td>Abstract: The number of spanning binary trees on a connected labelled</td>
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<td>undirected graphs</td>
<td>and Communication Project</td>
<td>labelled undirected graph is an important quantity which is closely</td>
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<td>related to the reliability of the graph as a network. Many problems</td>
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<td>and their app View more</td>
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<td>Study on shock graphs: graph representation of</td>
<td>Dhirubhai Ambani Institute of Information</td>
<td>Abstract: A shock graph is an abstraction of a two-dimensional shape of</td>
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<tr>
<td>objects</td>
<td>and Communication Project</td>
<td>an object. It represents the shape as a graph, using its boundary</td>
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<td>information. In this thesis, we study the shock graph representation</td>
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<tr>
<td>Embedding binary trees and caterpillars into the</td>
<td>Dhirubhai Ambani Institute of Information</td>
<td>Abstract: Embedding graphs is an important and well-studied theory in</td>
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<td>hypercube</td>
<td>and Communication Project</td>
<td>parallel computing. Finding the embedding of trees into hypercubes is</td>
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<td>an important, interesting and difficult problem. This work studies the</td>
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<td>Acyclic edge coloring of complete r-partite graphs</td>
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<td>Minimal Descriptors Agri-Horticultural Crops: Fruit Crops</td>
<td>KrishiKosh-Indian National Agricultural Research System</td>
<td>Reading</td>
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<td>Commercialization Of Spices Medical And Aromatic Crops 1 - 2Noov</td>
<td>KrishiKosh-Indian National Agricultural Research System</td>
<td>Reading</td>
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<td>National Symposium On Current Trends In Onion Garlic,Chillies,And Seed Spices Production Marketing Utilization</td>
<td>KrishiKosh-Indian National Agricultural Research System</td>
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<td>Threats And Solutions To Spices And Aromatic Crops Industry</td>
<td>KrishiKosh-Indian National Agricultural Research System</td>
<td>Reading</td>
</tr>
</tbody>
</table>
NDL Mobile App

Available on

Android

And

iOS
The *worth of a librarian should* be gauged by his power of attracting and looking after such circles by acting as the intermediary of an intimacy of relationship between *reader and the library*. – *Rabindranath Tagore*
# Roles and Responsibilities

## Host Institution
- **IDR**
  - Support for Setting up IDR
  - Installation CD
  - Manual
  - Training
  - IDR Service, if needed
- **Metadata**
  - NDL Metadata Standard
  - Creation, Curation Workflow
- **User**
  - Institutional Registration for Nodal Person
  - Bulk Addition of Users
- **Ongoing Support**
  - Over email, phone
  - Hands-on at NDL, if needed

## Contributing or Participating Institution
- **IDR (CI only)**
  - Setup IDR in Institutional LAN
  - Register with OPENDOAR / ROADMAP
  - OAI-PMH compliance for harvesting
  - OAI-ORE compliance for full-text access
  - Allow external access & Update regularly
- **Content (CI only)**
  - Add Content
  - Encourage faculty, students, staff to contribute
  - Create and Curate Metadata
- **User**
  - Register as an Institution
  - Add users in bulk or send to NDL
- **Promote**
  - Organize Workshop
  - Identify and Integrate Source
Technology of NDL

METADATA ENGINEERING

USER INTERFACE & EXPERIENCE TRACKING
• Metadata Standard
• Metadata Acquisition
Metadata Standard

Source: http://courseweb.ischool.illinois.edu/~butler9/LIS501b/current.html
Metadata Standard

**Metadata**
- Is primarily *textual information* relating to Content
- Includes information that enables users to *identify, discover, search, browse, interpret, or manage* Content
- Includes *hyperlinks* that direct users to Content on the Source
- May include an *expressive description* of the Content

**Metadata Standard**
- Defines *common understanding of the semantics* of the data
- Ensures *correct and proper use* and interpretation of the data
- Defined through a *set of fields, vocabs* (optional), and *instructions* for fill-up
NDL Metadata Design Challenges

- **Wide category of resources**
  - Generic metadata or domain specific?
- **Openness of repository**
  - Closed metadata standard may fail to describe a new resource
- **Scale is enormous**
  - Manual annotation is infeasible
  - Automatic annotation guided by crowd sourcing?
Metadata Requirements Specs

- To describe any digital resource
  - Generic content metadata
    - Contributor, Description, Language, Format etc.
- To describe domain specific resources
  - Educational content metadata
    - Educational level, ToC, Type of learning material etc.
  - Thesis metadata
    - Institution, advisor, degree, researcher
NDL Metadata Standard

- NDL Metadata Standard v 1.0 is an Open Virtual Standard
- Schema is categorized into three profiles:
  - **Generic Metadata:**
    - Describes general attributes of the contents
    - Adopted from Dublin Core Metadata Standard
  - **Educational Metadata:**
    - Describes the educational attributes of the resources and helps in enumerating properties of the contents relevant to teaching-learning process
    - Adopted from Learning Resource Metadata Initiative (LRMI)
  - **Thesis Metadata:**
    - Describes dissertation or thesis related metadata fields
    - Adopted from Shodhganga Thesis Metadata Standard
- More profiles may be added in future
- Uses the namespace of Dublin Core (dc.)
Metadata Envelop

- Dublin Core (generic)
  - title
  - type
  - language
  - date
  - author
  - description

- LRMI (educational)
  - board
  - difficultyLevel
  - typicalLT
  - prerequisiteTopic
  - typeofLM
  - pedagogicObjective
  - educationLevel

- NDL Metadata

- Shodhganga (thesis)
  - researcher
  - keyword
  - advisor
  - place
  - department
  - institution
  - awarded
  - degree
\[ \frac{M \Sigma}{\delta(\alpha)} \]

**Metadata Acquisition**
Acquisition Scenarios

<table>
<thead>
<tr>
<th>Locate Content</th>
<th>Acquire Metadata</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Harvest Institutional IDR(s)</td>
<td>• Creation</td>
</tr>
<tr>
<td>• Crawl Websites</td>
<td>○ Manual</td>
</tr>
<tr>
<td>• In Bulk – from Publishers</td>
<td>○ Automated</td>
</tr>
<tr>
<td>• Donated by Source</td>
<td>• Translation</td>
</tr>
<tr>
<td>• Source-supported API</td>
<td>○ Format</td>
</tr>
<tr>
<td>• ...</td>
<td>○ Standard / Schema</td>
</tr>
<tr>
<td></td>
<td>• Curation</td>
</tr>
<tr>
<td></td>
<td>○ Manual</td>
</tr>
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<td>○ Assisted</td>
</tr>
<tr>
<td></td>
<td>• Ingestion</td>
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</tbody>
</table>

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Challenges in Metadata Acquisition

- Different sources follow different norm in annotation
  - Automation of curation
- Errors in sourced data
  - Error listing
  - Manual curation
- Errors in manual annotation
  - Review step before actual submission in database
  - Manual curation
- Set up norm/guideline
  - Controlled vocabulary
Translation Issues

- Variation in Subject classification standards
  - Dewey Decimal Classification (DDC)
  - Library of Congress Classification (LCC)
  - Library of Congress Subject Headings (LCSH)

- Mapping terminology for different languages
  - **Translate** when equivalent terminology is present
  - **Transliterate** otherwise
Automated metadata extraction workflow

Syntactic metadata extractor
- Author name, ISBN, Publisher, dates etc.

Table of content extractor

Wikification for keyword extraction

Learning resource metadata

Toolchain for metadata extraction

Once completed and tested, the toolkit will be released to public and open-sourced
Experience Tracking and UI

- Experience Tracking
  - To offer customized search results

- Multi-lingual Support
  - Reduce cognitive load for native use

- Personalization
  - Customized UI to suit user grade

Experience API (xAPI) / Tin Can API

- Connects learning content and learning systems to record and track all types of learning experiences

Learning Record Store (LRS)

- Stores learning experiences

Infer:

Partha learnt – tiger is the national animal (of India)

... possibly

Source: https://tincanapi.com/overview/
UI
Technology: Web Interface

API End Points:
- RestFul API endpoint
- CMS API, Index API and LMS API
- Parameterized access to the index

API Sandbox

- Web interface is an app using NDL API
- Extended Search Features
  - Facet based search result refinement
  - DDC Topic tree based content browsing
  - Tag, comment on a content
  - Target group specific interface
  - Bookshelf
  - Rating and sharing

- NDL-Specific Features
  - Multi-lingual enablement
    - Multi-lingual query interface powered by Google transliteration
    - Cross-lingual search
  - Personalization
Copyright & License

HOW DOES NDL COPE WITH COPYRIGHT AND LICENSING ISSUES
Copyright Act, 1957 (Amendment 2012)

Is metadata copyrighted?

Yes / No / May be

Copyright of Metadata is contested

Source: http://lj.libraryjournal.com/2013/02/opinion/peer-to-peer-review/metadata-and-copyright-peer-to-peer-review/

• Copyright is a bundle of rights given by the law to
  ○ Creators of literary, dramatic, musical and artistic works and
  ○ Producers of cinematograph films and sound recordings

• Rights are:
  ○ reproduction of the work,
  ○ communication of the work to the public,
  ○ adaptation of the work and,
  ○ translation of the work

• Creator / Author is the first Owner

• Ownership (Title) can be transferred (assigned)
• NDL principles as follows:
  ○ Vast Majority of Metadata is Not Subject to Copyright Restrictions
  ○ NDL’s Partners Share the NDL’s Commitment
  ○ NDL Asserts No Rights Over its Database of Metadata and Dedicates its Contributions to the Public Domain
  ○ Free and Unencumbered Access to Metadata

License Mechanisms

• Content Access Views in NDL
  ○ Metadata View
    § This shows the metadata of the item – as maintained in NDL
  ○ Full Text View
    § This shows the view and provides access to full text – offered by the content source

A license encapsulates the rights & privileges that a copyright holder grants to someone else vis-à-vis something they have created
Transport, magnetic, and Sn-119 Mossbauer studies on magnetically ordered valence fluctuating compound SmRuSn3

<table>
<thead>
<tr>
<th>Author</th>
<th>Mazumdar, C. · Hossain, Z. · Nagarajan, R. · Godart, G. · Dhar, S. K. · Gupta, L. C. · Padalia, B. D. · Vijayaraghavan, R.</th>
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<td>cerusn3</td>
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<td>Abstract</td>
<td>SmRuSn3 is a unique compound among the known Sm-based valence fluctuation (VF) systems. Its crystallographic structure has two inequivalent Sm sites and Sm ions at only one of them are in VF state while the Sm ions in the other site orders magnetically. Our (119)Mossbauer studies show a quadrupolar splitting at the Sn site, consistent with the noncubic symmetry of the Sn site. A broadening of the Mossbauer spectrum is seen due to magnetic ordering of the material. The transferred hyperfine field at Sn site at 4.2 K is small. (c) 1996 American Institute of Physics.</td>
</tr>
</tbody>
</table>
Transport, magnetic, and 119Sn Mössbauer studies on magnetically ordered valence fluctuating compound SmRuSn3


Citation: J. Appl. Phys., 79, 6349 (1996); doi: 10.1063/1.361996

View online: http://dx.doi.org/10.1063/1.361996

View Table of Contents: http://jap.aip.org/resource/1/JAPIAU/v79/i28

Published by the American Institute of Physics.
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<td>Full-text available to all (Example: NCERT)</td>
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<td>Full-text access requires authorization by Source authority and separate login to the Source (Example: IIT Jodhpur)</td>
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</table>
National Licensing

• An initiative by eSS:
  ○ e-ShodhSindhu: Consortium for Higher Education Electronic Resources

• Licensing being negotiated with Publishers
  ○ Institutional License:
    ▪ Accessible from within designated institutional network: IP filtered
  ○ NDL Supported License:
    ▪ Accessible if requested from NDL: Concurrent use-basis
NDLI Research

- Aggregation in the Wilderness:
  Varying metadata schema, lack of awareness, embargo, quality of data and multifarious challenges led the team to innovate on a sustainable workflow.
**NDLI Research**

- **SURROGATOR:**
  - Makes available pre-print copies of academic resources that are otherwise unavailable to learners
  - A customizable application that can identify surrogates for access-restricted publications in digital libraries
  - Surrogator can make a case for the evolution of specific subject matters through pre-print indexing and open up a whole new realm of research
  - Application is being tested through NDLI, can easily be extended to other digital libraries
• Platform impact study:

Very difficult to quantify impact directly

• INDIRECT METHODS:
  - Social signals
  - Interaction Signals
  - Activity Signals

• SERVICE EVALUATION
• USABILITY EVALUATION
• INFORMATION RETRIEVAL EVALUATION
• COGNITIVE EVALUATION
Project Status
NDLI IDR Workshops

1. National (General) IDR WS @ IIT Kharagpur, 15/17-June-15
2. Regional (North-East-I) IDR WS @ IIT Guwahati, 04/05-July-15
3. Regional (North-I) IDR WS @ IIT Roorkee, 24/25-Aug-15
4. Regional (West-I) IDR WS @ M S University, 28/29-Jan-16
5. Regional (South-I) IDR WS @ IIT Madras, 25/26-Mar-16
6. Regional (South-II) IDR WS @ IISc, Bangalore, 20/21-May-16
7. Regional (South-III) IDR WS @ IIIT, Hyderabad, 01/02-Jul-16
8. Regional (North-II) IDR WS @ JNU, New Delhi, 01/02-Sep-16
9. Regional (North-East-II) IDR WS @ NIT, Meghalaya, 23/24-Sep-16
10. Regional (West-II) IDR WS @ IISER, Pune, 05/06-Oct-16
11. National (Medical) IDR WS @ AIIMS, New Delhi, 20/21-Oct-16
12. Regional (Central-I) IDR WS @ NIT, Raipur, 18/19-Nov-16
13. National (Legal) IDR WS @ NUJS, Kolkata, 09/10-Dec-16
14. Regional (East-I, NIT) IDR WS @ NIT, Rourkela, 13/14-Jan-17
15. Regional (Central-II) IDR WS @ ABV-IIITM, Gwalior, 09/10-Feb-17
16. Regional (East-II) IDR WS @ University of Calcutta, Kolkata, 10/11-Mar-17
17. Regional (South-IV) IDR WS @ SPA, Vijayawada, 21/22-Apr-17
18. Regional (West-III) IDR WS @ MNIT, Jaipur, 12/13-May-17
19. Regional (North-III) IDR WS @ IIT-BHU, Varanasi, 02/03-Jun-17
20. Regional (South-V) IDR WS @ P N Panicker Foundation, Trivandrum, 20/21-Jun-17
21. Regional (North-IV) IDR WS @ IIAS, Shimla, 21/22-Sep-17
22. Regional (East-III) IDR WS @ IIT Dhanbad, 24/25-Nov-17
23. Regional (West-IV) IDR WS @ Goa Engineering College, 18/19-Jan-18
24. Regional (North-V) IDR WS @ IIT Ropar, 16/17-Mar-18
25. Regional (North-VI) IDR WS @ University of Jammu, 06/07-Apr-18
26. Regional (North-VII) IDR WS @ IICA, Manesar, 07/08-Sep-18
27. Regional (East-IV) IDR WS @ IIT Patna, 17/18-Sep-18
1. National VC Address over NKN, 03-Feb-16
2. National VC Address over NKN, 26-Sep-16
3. Regional (North-I) User WS @ Jamia Millia Islamia, New Delhi, 20-Oct-16
4. Regional (South-I) User WS @ Pondicherry, New Delhi, 16-Nov-16
5. User WS @ SPOC workshop of NPTEL Local Chapter Colleges of East Zone, IIT Kharagpur, 23-Dec-16
6. Interaction with Publishers @ P N Panicker Foundation, Trivandrum, 05-Jan-17
7. Lecture @ Training Workshop for Librarians’ @ P N Panicker Foundation, Trivandrum, 06-Jan-17
8. Regional (South-II) User WS @ Trivandrum, 20-Jun-17
9. TEQIP III, CET & CEP, IIT Kharagpur, 06-Feb-18
10. Regional (North-III) User WS @ Chandigarh University, 15-Mar-18
12. TEQIP IV @IIT Kharagpur, 28-Jun-18
13. Regional (East-I) User WS @ Splendour School, Kharagpur, 10-July-18
14. Regional (East-II) User WS @ DAV Model School, Kharagpur, 11-July-18
15. Regional (East-III) User WS @ St.Agnes School, Kharagpur, 12-July-18
16. Regional (North East-I) User WS @ Pub Kamrup College, Kamrup, Assam, 19-July-18
17. User WS on 68th Foundation Day of IIT Kharagpur, 18-August-18
18. Regional (North East-II) User WS @ Shankardev Sishu Vidya Niketan, mangaldai, 21-August-18
19. Regional (North East-III) User WS @ Faculty Higher Secondary School, 24-Aug-18
20. Regional (North East IV) User WS @ Patidarrang College, 28-August-18
21. Regional (North East V) User WS @ Puthimari College, 29-August-18
22. Regional (North East VI) User WS @ Gauhati University, 13-September-18
NDLI Public Library Workshops

1. Regional (North-I) User WS @ Directorate of Public Libraries, Jammu, 11-Dec-17
2. Regional (South-I) User WS @ Directorate of Public Libraries, Chennai, 22-Mar-18
3. Regional (South II) User WS @ Directorate of Public Libraries, Hyderabad, 13-May-18
4. Regional (North II) User WS@ Directorate of Public Libraries, Jaipur, 22-Jun-18
Library Automation and Management Workshop

- OSSLM 2018: National Workshop for Open-Source Software for Library Management @ IIT Kharagpur, 7/12-May-18
- OSSLM 2017: National Workshop for Open-Source Software for Library Management @ IIT Kharagpur, 12/17-Jun-17
- OSSLM 2016: National Workshop for Open-Source Software for Library Management @ IIT Kharagpur, 13/18-Jun-16
• eduPreneurship @ GES 2018, 03/04-Feb-18 –IIT Kharagpur
• eduPreneurship @ GES 2017, 04/05-Feb-17-IIT Kharagpur
National Workshop on Copyright Issues in Digital Libraries @ IIT Kharagpur
9th Feb - 10th Feb 2018

Focused on three things:

Are our librarians familiar with the Indian Copyright Act (2012)?
What are their rights?
What can one do beyond the Copyright Act that will not be considered infringement?
NDLI International Event

IFLA WLIC 2018
Kuala Lumpur, Malaysia | 24th Aug - 30th Aug 2018

International Relations: How far have we come and where do we go from here?
Progress, feedback and feasibility - National Organizations and International Relations SIG (SIGNOIR)
Conducted in short presentation and roundtable discussions mode with Focus on BRICS | 26th Aug 2018

Presentation
National Digital Library of India - International Engagement: Experiences and Lessons learned

Speakers
National Library of Russia
National Library of China (Silk Road International Library Alliance)
National Library of South Africa (BRICS Alliance of Libraries)
National Digital Library of India
Let’s work together: collaborating and partnering to achieve IFLA’s vision
Conducted in short presentation and roundtable discussions mode | 29th Aug 2018

Presentation
Taking advantage of digital innovation in the National Digital Library of India

Speakers
Special Session by Christine Mackenzie, President-elect of IFLA on IFLA’s Global Vision Report Summary. The theme was Collaboration, Vision 7 in the summary report while deliberations was around the visions of Advocacy and Young professional. Partha Pratim Das spoke on Digital Innovation.
Kristian Jensen (Co-Chair, UNESCO-NDL WS) highlighted the collaboration between NDLI and British Library on the India project and spoke highly of working together.
Buhle Mbambo-Thata - African Library & Information Associations & Institutions
Allison Dobbie - Auckland Council, Govt of New Zealand
Ana María Talavera Ibarra - Pontificia Universidad Católica del Perú
Christine Mackenzie - Australian Library and Information Association
Partha Pratim Das
The session was coordinated and moderated by Ms. Deborah Jacobs, the Director of Global Libraries at the Bill and Melinda Gates Foundation
IFLA Cultural Heritage in the Community: Assessing the Impact of Digital Libraries
Conducted in long presentation and end-of-session joint Q&A mode | 29th Aug 2018

**Presentation**
Analytics and Impact Assessment in National Digital Library of India

**Speakers**
Charles Henry – CLIR talked about NDLI as a potential partner in PANGiA project.
Wan Wong – National Library of Australia (Trove)
Susan Reilly – National Library of Qatar (Qatar Digital Library)
Jeanne Drewes – Library of Congress (Digitization)
Partha Pratim Das – National Digital Library of India

Themes
- Digital Library Technologies
- Standards and Interoperability
- Search and Information Retrieval
- Designing for the User
- Access & Rights
- World Digital Libraries

Participating Libraries, Projects
- Europeana Foundation (EU, The Netherlands)
- National Library of New Zealand (DigitalNZ),
- National Library of Australia (TROVE),
- Tainacan Project (Brazil),
- German Digital Library,
- National Library of The Netherlands,
- National Library of South Africa,
- National Library of Nepal, and
- British Library (UK)
- Google Scholar
- Microsoft Academic
- Participants from Belgium, Canada, USA, Bangladesh

22 speeches spread over 9 sessions and 4 panel discussions, 30 speakers from over 12 countries
• Consultative Meeting with FINNA.FI: National Library of Finland @ Helsinki, Finland, 04-Sep-17

• Consultative Meeting with Europeana Library @ The Hague, The Netherlands, 16-Mar-17

• ICDL 2016 [Embedded WS], New Delhi, 13/16-Dec-16
NDLI National Events

- NDLI-NE-RC (North-East Regional Center) inauguration at IIT Guwahati, 20-Apr-2018
- ETAL 2015: National Seminar on *Emerging Trends in Academic Libraries* @ IIT Kharagpur, 21-Aug-15
NDLI Participations (Keynote)

- 11th National Conference on Recent Advances in Information Technology (READIT-2018)-Indira Gandhi Centre for Atomic Research-8th- 9th Aug 2018- Prof. Partha Pratim Das
- IS-RPLS-DRS: International Seminar on Rejuvenating Public Library Services through Digital Reference Sources-Jadavpur University-22nd Feb - 23rd Feb 2018-Prof. Partha Pratim Das and Dr. B Sutradhar
- Emerging Trends and Technologies in Libraries and Information Services (ETTLIS-2018)-Bennett University-21st - 23rd Feb 2018-Dr. B Sutradhar
- LTC 2018: Library Technology Conclave-Goa University-23rd - 25th Jan 2018- Dr. Plaban Kumar Bhowmick
- National Conference on Role of Academic Libraries for Excellence in Research-IISER, Bhopal-18th - 19th Jan 2018-Dr. B Sutradhar
- DHDS 2018: International Seminar on Digital Humanities and Digital Societies in the Contemporary World-Calcutta University-18th - 19th Jan 2018-Dr Plaban Kumar Bhowmick & Debarshi Kumar Sanyal
• LINE 2017: Libraries in Next Era Digital India – What Libraries can Do-Kalyani University-Dr. Plaban Kumar Bhowmick
• IWTPLA: International Workshop cum Training Programme on Library Automation, Satyajit Ray Film and Television Institute (SRFTI)-SRFTI-13th Nov -18th Nov 2017-Prof. Partha Pratim Das and Dr. B Sutradhar
• CALIBER 2017, 4th Conference on Re-Envisioning Role of Libraries: Transforming Scholarly Communication-Anna University, Chennai-2nd - 4th Aug 2017-Dr. B. Sutradhar
• Conference on Open Access – The Road to Freedom, Society for Information Sciences-CSIR-IICB-7th - 8th Apr 2017
• MZU-ICLIS-2017: International Conference on Library and Information Services in Knowledge Society-Mizoram University-1st - 3rd Mar 2017
• National Consultation on the National Mission of Reading-P N Panicker Foundation, Trivandrum-1st - 2nd Mar 2017
• PLANNER 2016 [Embedded WS]-North Eastern Hill University, Shillong-9th Nov 2016
NDLI Participations (Invited Lecture)

- Short Term Course (STC) on "Smart and Green Information and Communication Technology (SGICT)"-Jadavpur University-17th May 2018-Debarshi Kumar Sanyal
- IPLC 2017: 3rd Indian Public Libraries Conference, New Delhi-IPLM-3rd - 5th Oct 2017-Prof. Partha Pratim Das and Dr. B Sutradhar
- 4th NKN Annual Workshop-JNTU Hyderabad-21st - 22nd Jan 2016
- ETD 2015 India-JNU New Delhi-5th- 6th Nov 2015
- Workshop @ INDEST Meet-IISER Mohali-29th- 30th Apr 2015
NDLI Participations

- Annual Steering Committee Meeting of Rights Statements 2018-New York Public Library-8th Jun 2018-Prof Partha Pratim Das, Dr. B Sutradhar
- RightsStatements.org, Steering Committee Meeting, The Hague, The Netherlands-European Foundation-7th - 8th Sep 2017-Prof. Partha Pratim Das
- mBillionth 2017 Awards, New Delhi-mBillionth South Asia-4th Aug 2017-Prof. Partha Pratim Das, Dr. B Sutradhar, Dr Plaban Bhowmick
- Summer School on Document Analysis: Document Informatics 2017-CEERI, Pilani-23rd- 28th Jan 2017
- Digital Archive Inauguration-Presidency University-16th Jan 2017-Nanda Gopal Chattopadhyay, Dr Plaban Kr Bhowmick
NDLI Participations
(Tech Demonstration)

- Canadian Undergraduate Computer Science Conference (CUCSC) - University of Calgary, Canada - T. Y. S. S. Santosh
- Demo Track in ACM India Joint International Conference on Data Sciences and Management of Data (CoDS-COMAD '18) - Goa University - 11th - 13th Jan 2018 - T. Y. S. S. Santosh
• Joint Conference on Digital Libraries 2018: From Data to Wisdom: Resilient Integration across Societies, Disciplines, and Systems-University of North Texas-3rd Jun - 6th Jun 2018-Dr Plaban Kumar Bhowmick
NDLI Live:
www.ndl.gov.in
https://ndl.iitkgp.ac.in/

NDLI on Facebook:
https://www.facebook.com/NDLIndia/

NDLI on Twitter:
https://twitter.com/NDLIndia

NDLI on Linkedin:
https://www.linkedin.com/company/ndlindia/

NDLI on YouTube:
https://www.youtube.com/c/NDLIndia

NDLI Project:
https://ndlproject.iitkgp.ac.in/
1. Susmita Sadhu Chatterjee, **Automatic Segmentation and Semantic Annotation of Verbose Queries in Digital Learning**, Presented in 22nd International Conference on Theory and Practices of Digital Libraries held at Faculty of Engineering of the Universities of Porto (FEUP), September 10-13, 2018

2. Poonam Anthony and Plaban Kumar Bhowmick, **A Framework for Bibliographic Recommendation System based on Heterogeneous Information Retrieval Model**, The 20th International Conference On Asia-Pacific Digital Libraries (ICADL 2018) in New Zealand, to be held at University of Waikato, Hamilton, New Zealand, on 19-22 November 2018


4. Debarshi Kumar Sanyal, **Semantic Search in Digital Library**, Presented in International Seminar on Digital Humanities and Digital Societies in the Contemporary World, January 18-19, 2018


Status ...

- Items: 1.8Cr+
- Metadata: Version 1.0 of Standard Published
- Sources: 180 (IDRs: 100+)
- Registered Users: 4.1M+
- Daily Website Hits: ~11K+
- Android App Download: 1.11M
- iOS App Download: 57K+
- Daily Android / iOS Hits: ~11K+
- Registered User Institutions: ~9K
- Languages: 200+
- Learning Resource type: 90+
- Subject domain:
  - Most of the major educational areas
  - Educational Level: School Level (Class-I to XII) , UG and PG
Summary

The only thing that you absolutely have to know (may use Google, though), is the URL of NDL:

ndl.iitkgp.ac.in

Rest you find in NDL

Why are you waiting?

An umbrella over all IRs of India

User-Centric Design
- Multi-lingual Indic Interface
- Multi-faceted Search
- Multi-modal Filters
- User Experience Tracking for Personalization

Rich Set of Contents
- National Licensing
- Domain / Usage-focused Verticals

Metadata Engineering
- Metadata Standard
- Open Source Toolkit

NDLServices
- Open APIs for 3rd party development

Platform for Educational Ecosystem where all stakeholders participate, contribute and benefit

Spearheads NDL Movement

'The only thing that you absolutely have to know, is the location of the library.'

Albert Einstein