



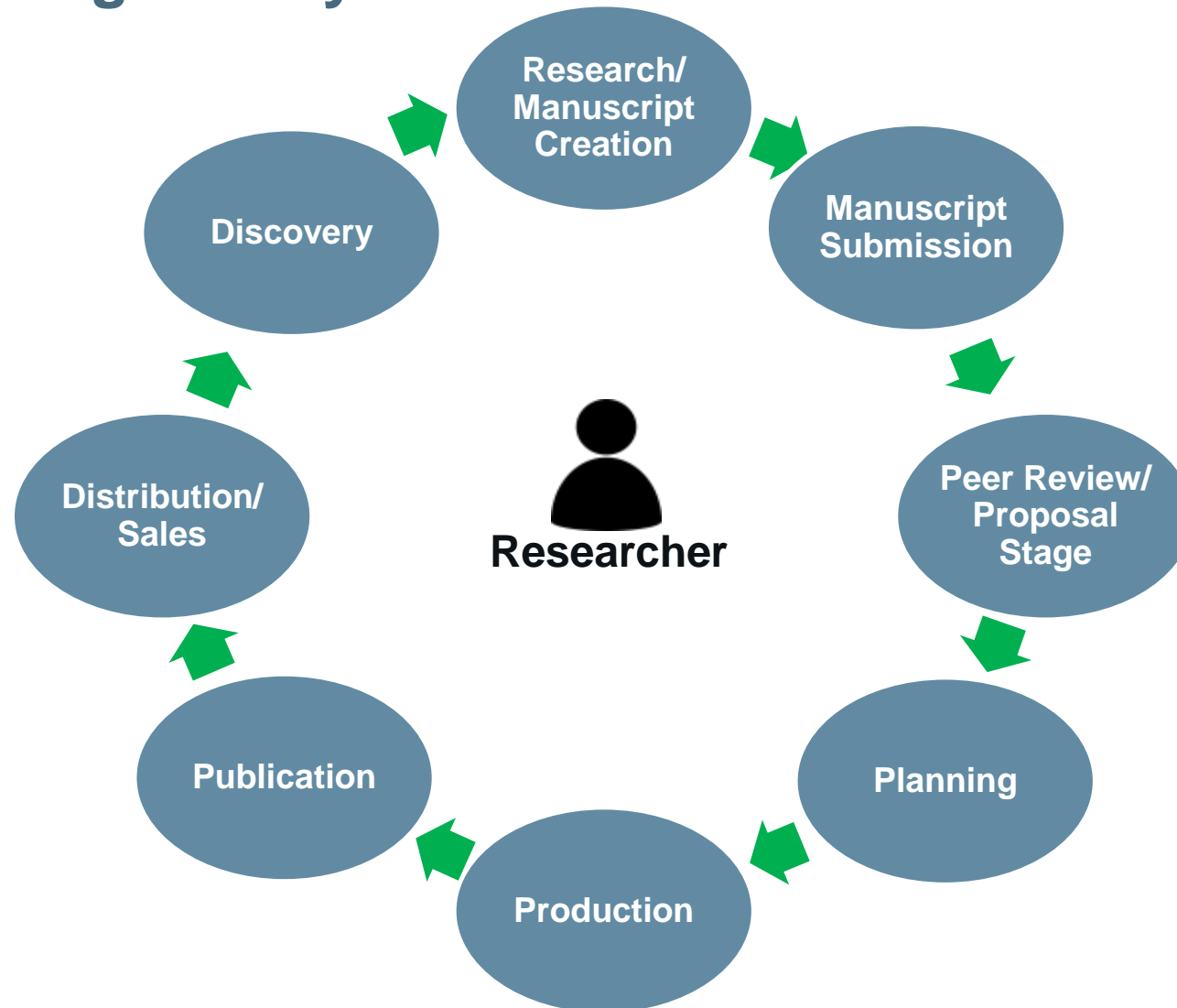
# Text and Data Mining at Springer Nature

Henning Schoenenberger

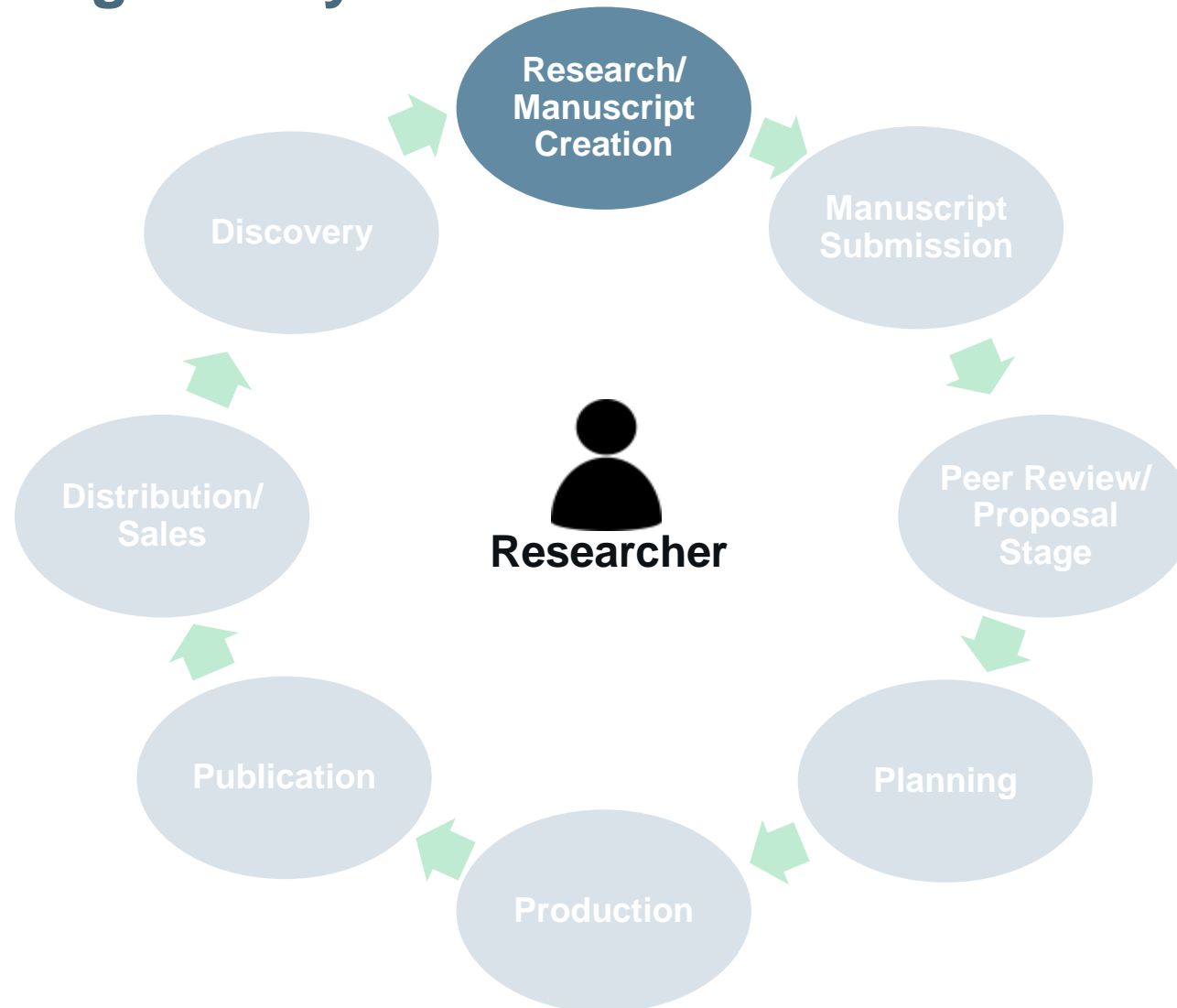
July 17, 2018

**SPRINGER NATURE**

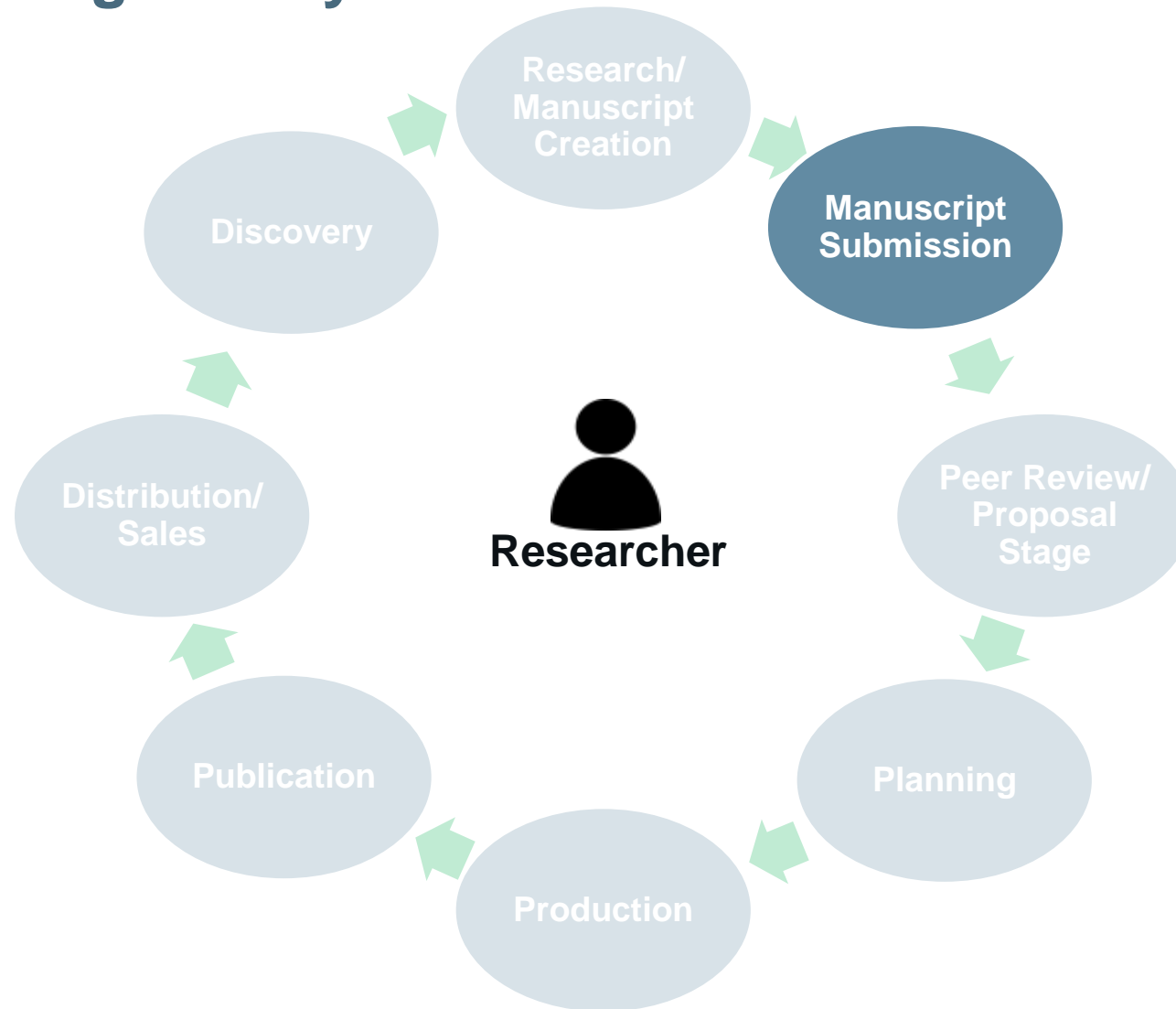
# Publishing Life Cycle



# Publishing Life Cycle



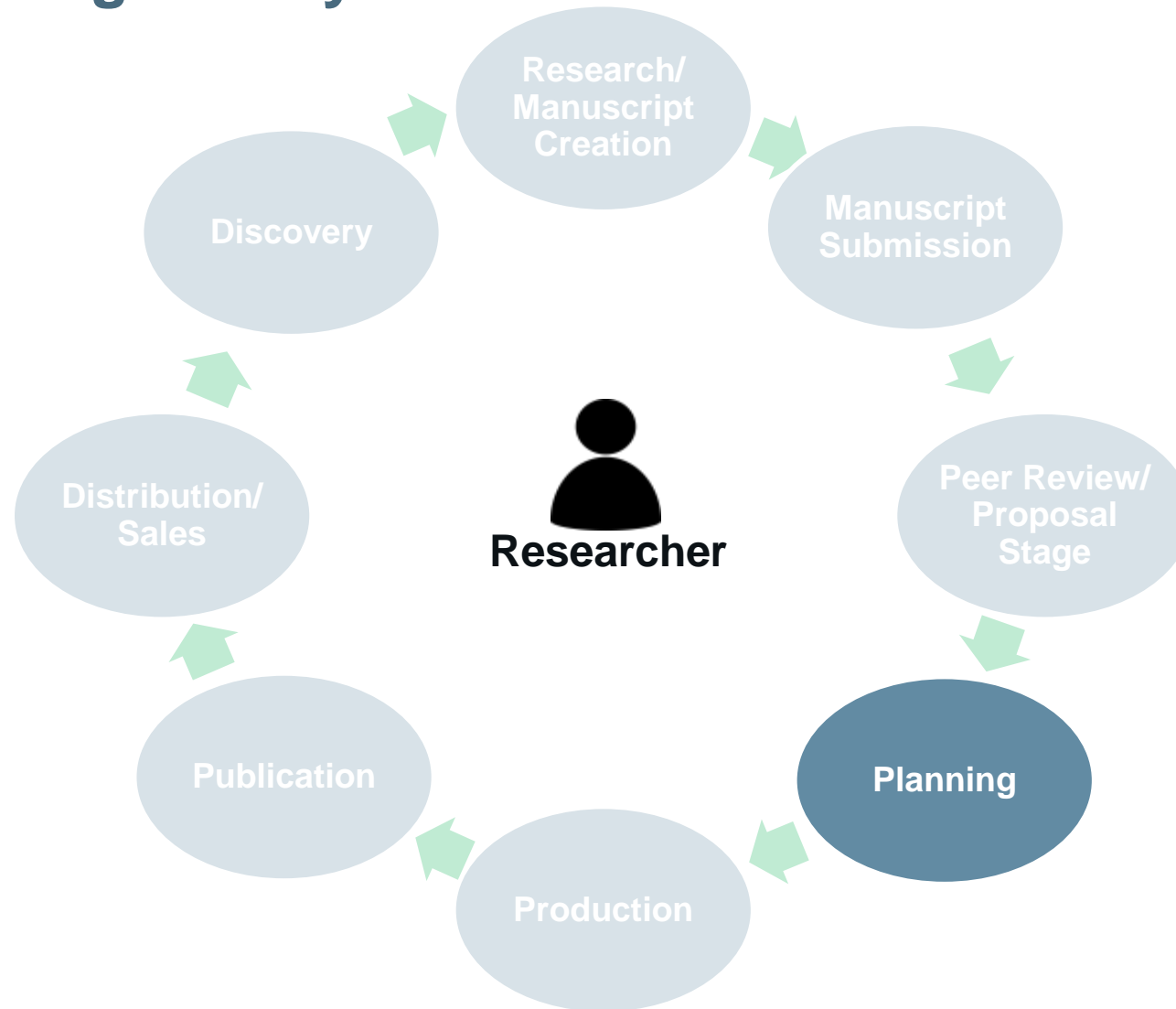
# Publishing Life Cycle



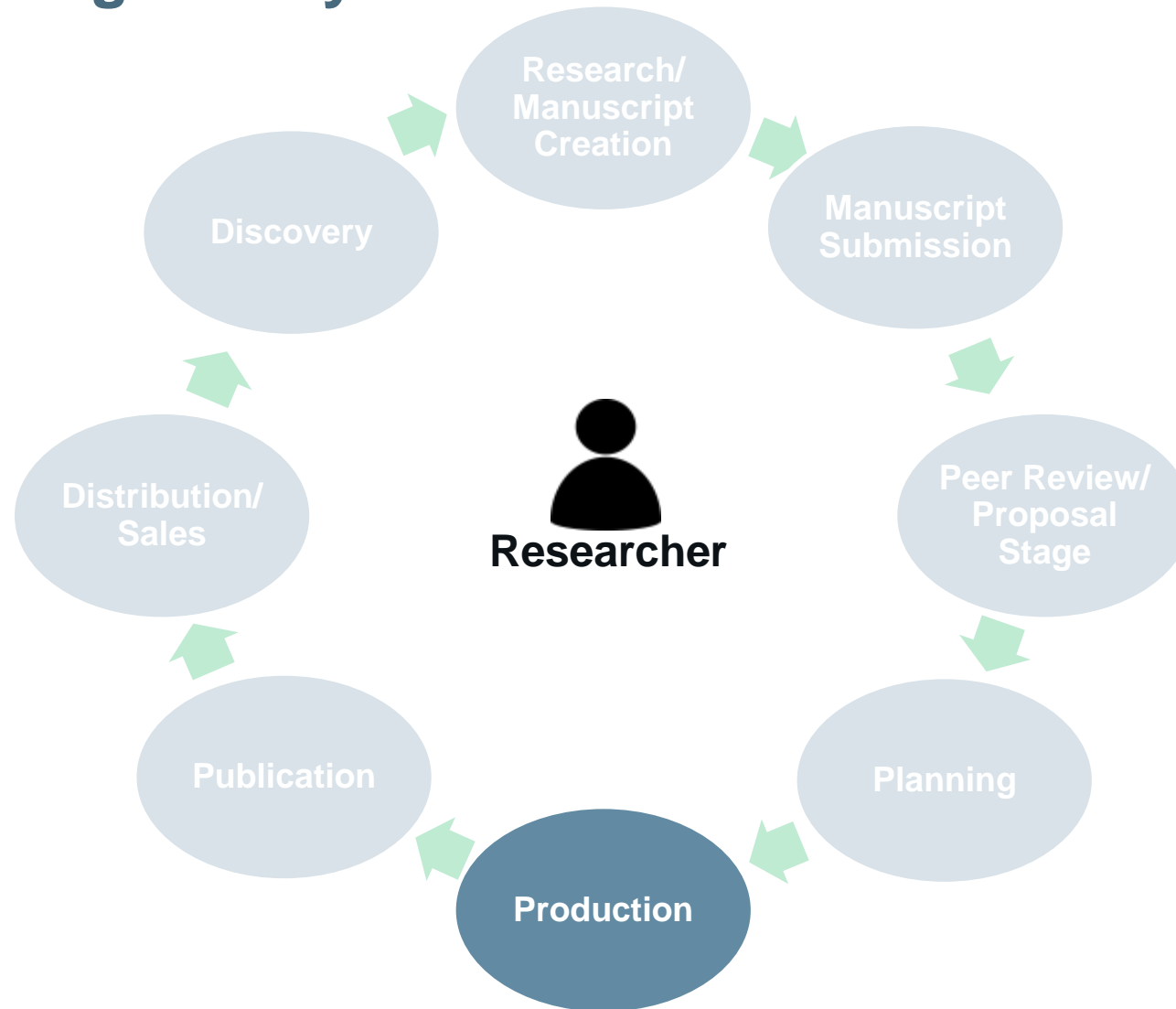
# Publishing Life Cycle



# Publishing Life Cycle



# Publishing Life Cycle

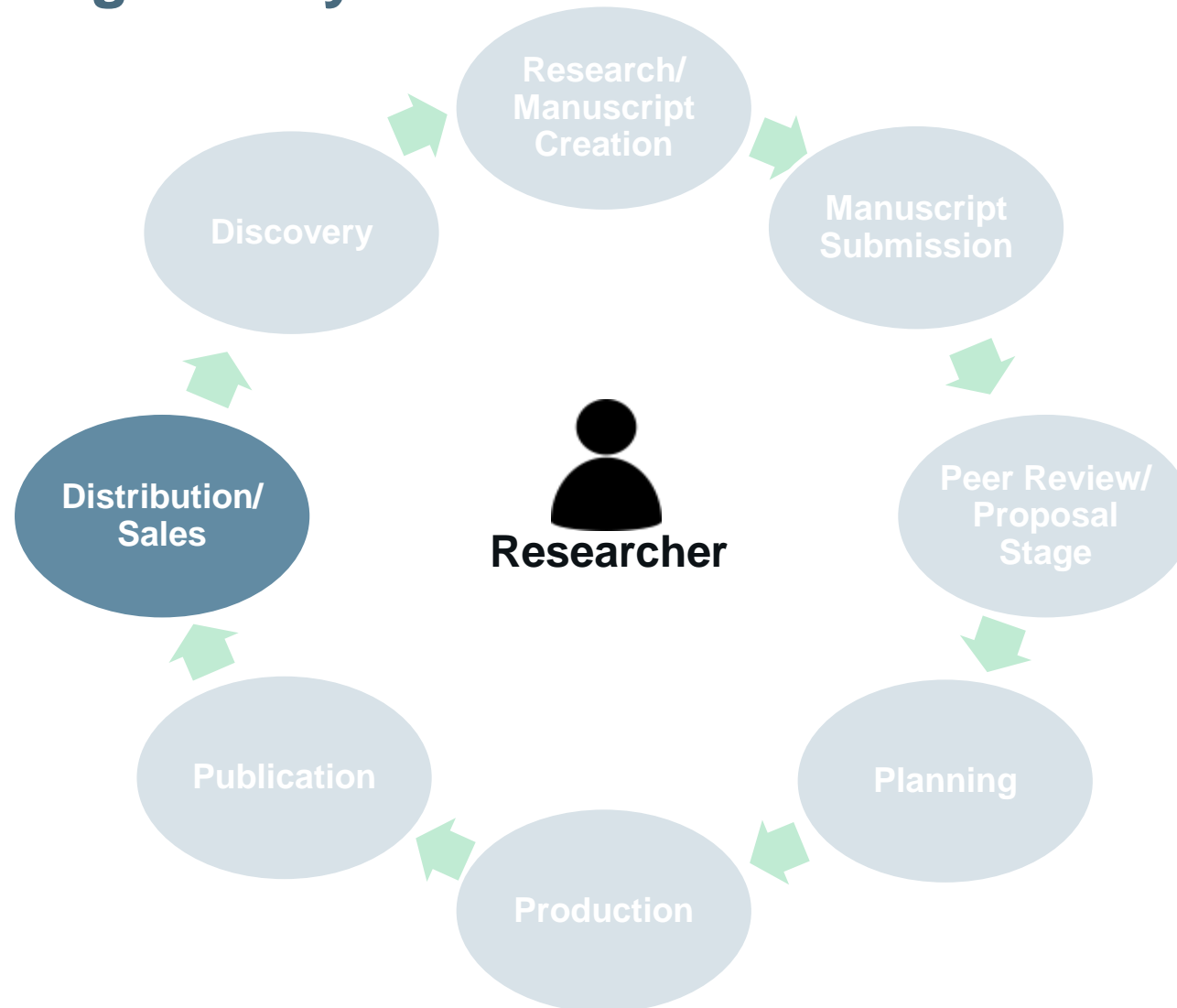


# Publishing Life Cycle

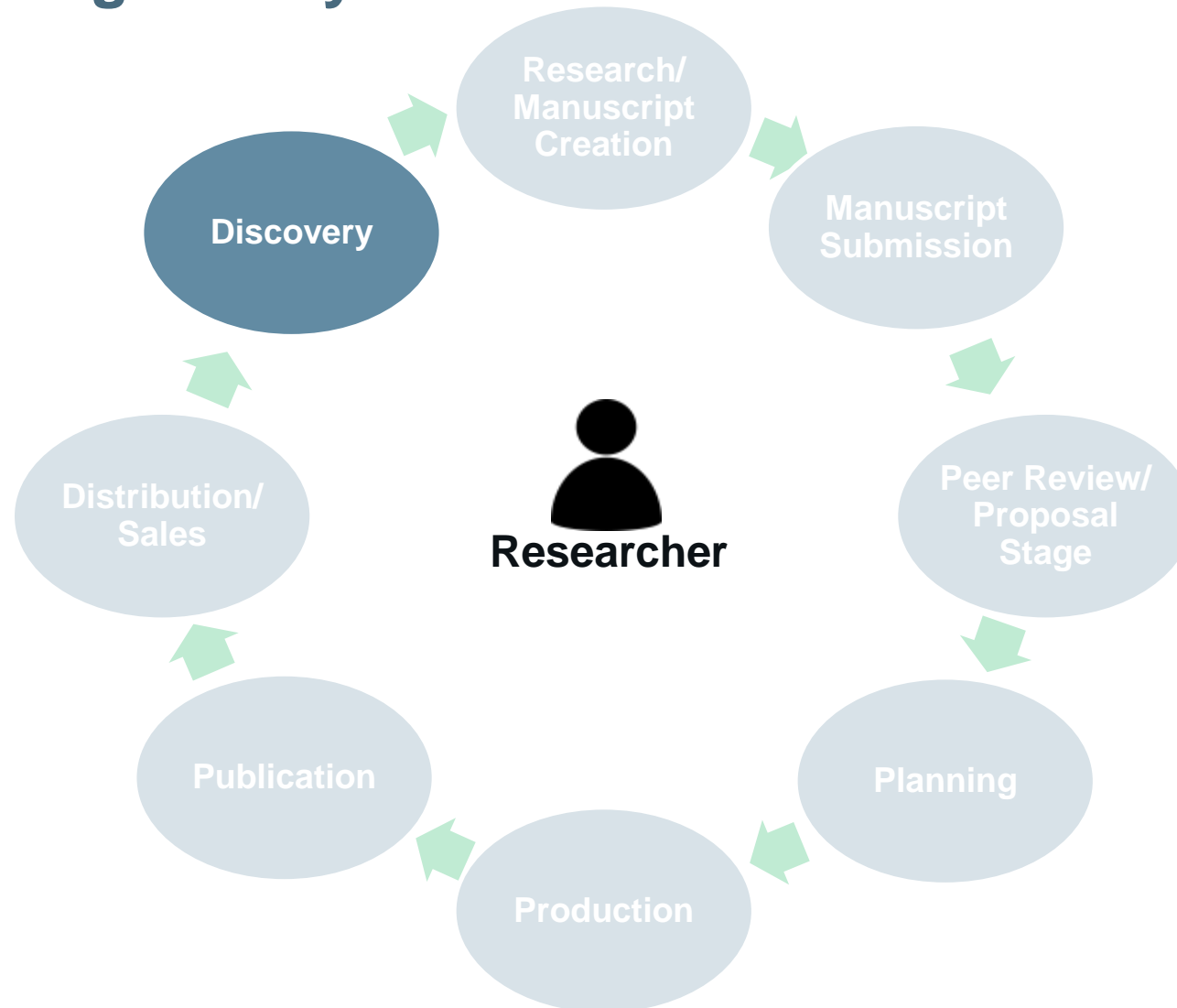




# Publishing Life Cycle



# Publishing Life Cycle



# TDM

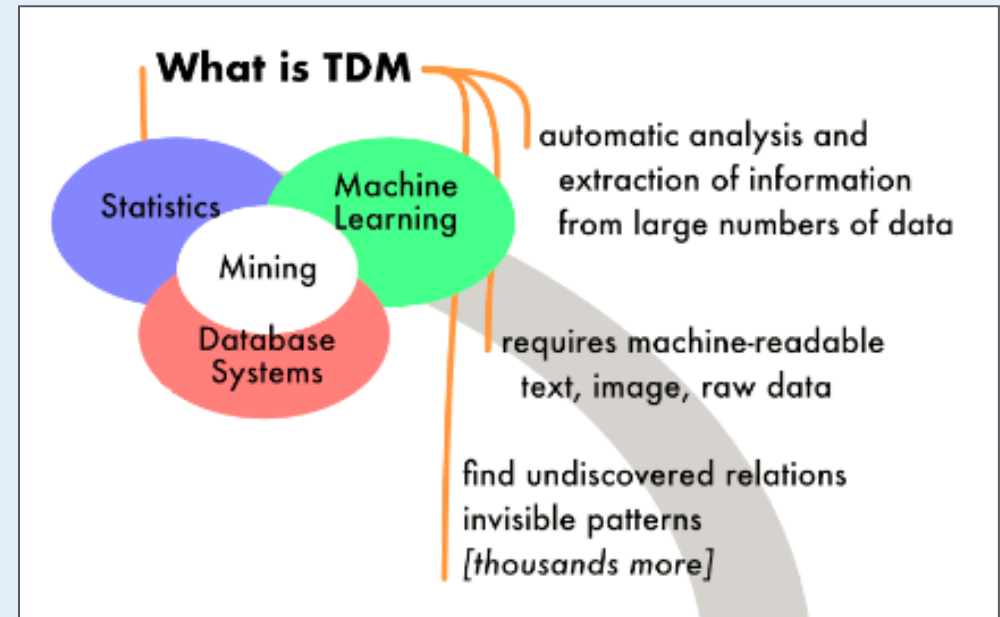
## Text and Data Mining

# Text and Data Mining

Text and Data Mining (TDM) is the (semi-)automated process of selecting and analyzing large amounts of text or data resources for purposes such as

- **searching,**
- **finding patterns,**
- **discovering relationships,**
- **semantic analysis and**
- **learning how content relates to ideas and needs**

in a way that can provide valuable information needed for studies, research, etc.



## Text and Data Mining => Use Cases

- Searching and archiving
- Metadata display
- Knowledge retrieval
- Multisource library
- Online portals
- Apps, products and solutions
- Fraud detection (banking, insurance) and spam filtering
  
- Some build in our APIs into their local search facility to simply improve their researchers' discovery experience, some others do specific term or data mining.
- Some go very deep into semantic text mining, some others want to retrieve hidden research data structures as part of given science programs.
- Some even may use TDM to investigate competitor activities and staff.

# Text and Data Mining => A TDM Framework for Springer Nature

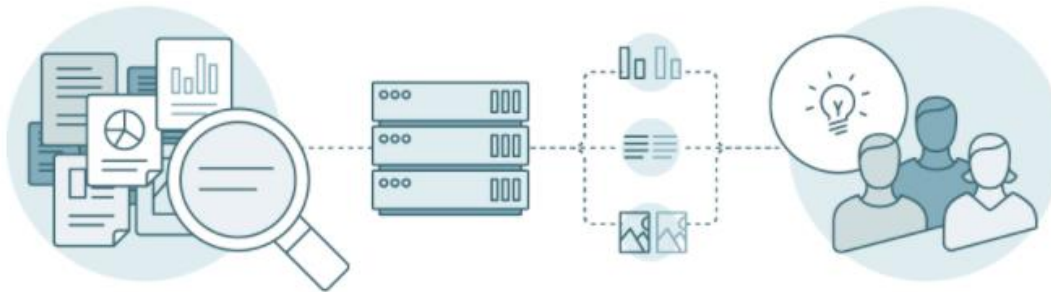
# Text and Data Mining => A TDM Framework for Springer Nature

## Text and Data Mining at Springer Nature

### What is TDM?

TDM (Text and Data Mining) is the automated process of selecting and analyzing large amounts of text or data resources for purposes such as searching, finding patterns, discovering relationships, semantic analysis and learning how content relates to ideas and needs in a way that can provide valuable information needed for studies, research, etc.

ADVANCING  
DISCOVERY



<https://www.springernature.com/text-and-data-mining>

**SPRINGER NATURE**

## Text and Data Mining

- A growing part of Springer Nature's journal articles is published open access.
- TDM is usually allowed without restrictions for these publications since the majority of Springer Nature open access content is licensed under CC-BY.



## Text and Data Mining at CrossRef

- Springer Nature is participating in the Crossref TDM working group and is recommending Crossref services for pan-publisher TDM.
- For further information see <http://tdmsupport.crossref.org/>

## Text and Data Mining for Subscribers

- For subscribers Springer Nature offers a large variety of TDM tools such as metadata and fulltext APIs, applicable to both open access and subscribed resources.
- See <https://api.springernature.com>

## Text and Data Mining for Non-Subscribers

- Non-subscribers are offered a variety of TDM tools for our Open Access resources, such as our Open Access fulltext API (see <https://api.springernature.com>).
- TDM requirements from non-subscribers for pay-walled content are treated on a case-by-case basis.
- Please contact [tdm@springernature.com](mailto:tdm@springernature.com).

## Image Mining

- At the moment Springer Nature does not offer any API for image mining.

# Argumentation Mining

- “Argumentation mining aims to automatically detect, classify and structure argumentation in text (...) i.e. understanding the content of serial arguments, their linguistic structure, the relationship between the preceding and following arguments (...).” (Mochales, R. & Moens, MF. Artif Intell Law (2011) 19: 1. <https://doi.org/10.1007/s10506-010-9104-x>)
- Argumentation mining can be considered as a subset of text mining. If you are planning to locally store non-open-access content during an argumentation mining project, please get in contact with [tdm@springernature.com](mailto:tdm@springernature.com) to discuss options.

# Springer Nature APIs

- **metadata**: general xml metadata using PAM standard (Prism Aggregate format); uses prism and dc (dublincore) namespaces and elements. In use but fixed (i.e., no changes will be made).
- **meta/v1**: based on metadata API. Has PAM standard but additional elements added for various business reasons. Fluid API to which changes can be easily made.
- **openaccess**: complete, “fulltext” (i.e., body) xml where available; when fulltext/body not available, xml metadata is provided.
- **integro**: journal-level information. Based on Casper journal xml (e.g., <http://www.live.springer.com/api/journal/10653.xml>).
- **xmldata**: JATS format for fulltext as available; else metadata.
  - Throttle: recommended crawling rate of 150 hits/minute and 7500/day.
  - Key: special key provided for TDM.
- **All APIs have xml and json except for xmldata and integro.**
- **A full picture of Springer Nature’s API offerings with detailed information, examples and API key sign-up can be looked up under <https://api.springernature.com>.**

# Springer Nature APIs

- **Citations APIs** (*internal*)
  - Article/chapter count: returns the number of citations for a given DOI.
  - Show citations: returns actual citations for a given DOI.
  - Book-level count: returns total count of citations for all the chapters in a book.
  - Journal-level count: returns total count of citations for all the articles in a journal.
  - Recent citations: provides recent citation data from Crossref.

# Linked Open Data Publishing So Far

## Springer Nature SciGraph

A Linked Open Data platform for the scholarly domain

▶ Watch video

Welcome to Springer Nature SciGraph, our Linked Open Data offering which aggregates data sources from Springer Nature and key partners from the scholarly domain. The Linked Open Data platform collates information from across the research landscape, for example funders, research projects, conferences, affiliations and publications.

Additional data, such as citations, patents, clinical trials and usage numbers will follow over time. This high quality data from trusted and reliable sources provides a rich semantic description of how information is related, as well as enabling innovative visualizations of the scholarly domain.

By doing so, Springer Nature SciGraph overcomes former boundaries by relating comprehensive information about the research landscape. It represents a further step in data integration and it will continue to grow organically. Our aim is to increase the discoverability of high quality data as larger parts of our datasets are being made available under CC-BY licensing.



Any questions?  
Please contact us. >

Latest Datasets  
Download >

Data Explorer >

Licensing  
Information >

### At a glance:

- 1,5B+ triples
- CC-BY license

### Metadata about:

- All articles + abstracts
- All books + chapters
- Grants (200k)
- Journals
- Subjects / Taxonomies
- Core Ontology

[www.springernature.com/scigraph](http://www.springernature.com/scigraph)



# Springer Nature APIs => General Constraints

- Example Queries

- DOI: [http://api.springer.com/metadata/pam?q=doi:10.1007/s10404-009-0428-3&p=2&api\\_key=xx](http://api.springer.com/metadata/pam?q=doi:10.1007/s10404-009-0428-3&p=2&api_key=xx)
- Subject: [http://api.springer.com/openaccess/jats?q=subject:Physics&api\\_key=xx](http://api.springer.com/openaccess/jats?q=subject:Physics&api_key=xx)
- Keyword: [http://api.springer.com/metadata/pam?q=keyword:patients%20sort:date&api\\_key=xx](http://api.springer.com/metadata/pam?q=keyword:patients%20sort:date&api_key=xx)
- Year: [http://api.springer.com/openaccess/jats?q=year:2011&api\\_key=xx](http://api.springer.com/openaccess/jats?q=year:2011&api_key=xx)
- Country: [http://api.springer.com/openaccess/jats?q=country:%22New%20Zealand%22&p=1&api\\_key=xx](http://api.springer.com/openaccess/jats?q=country:%22New%20Zealand%22&p=1&api_key=xx)
- ISBN: [http://api.springer.com/meta/v1/pam?q=isbn:978-0-387-79148-7&api\\_key=xx](http://api.springer.com/meta/v1/pam?q=isbn:978-0-387-79148-7&api_key=xx)
- ISSN: [http://api.springer.com/openaccess/jats?q=issn:1432-086X&api\\_key=xx](http://api.springer.com/openaccess/jats?q=issn:1432-086X&api_key=xx)



# metadata API

- [http://api.springer.com/metadata/pam?q=doi:10.1007/s10404-009-0428-3&p=2&api\\_key=xx](http://api.springer.com/metadata/pam?q=doi:10.1007/s10404-009-0428-3&p=2&api_key=xx)

- General Elements

- identifier (doi)
- title (of article/chapter)
- creator (author)
- publicationName (book, journal title)
- issn/isbn (electronic)
- genre (ArticleType/ChapterType)
- journalID
- volume
- number (issue)
- startingPage
- openAccess
- doi
- publisher
- publicationDate
- url (resolver)
- copyright
- abstract

```

<pam:article>
  <dc:identifier>doi:10.1007/s10404-009-0428-3</dc:identifier>
  <dc:title>Numerical analysis of electrokinetic transport in micro-nanofluidic
  <dc:creator>Wang, Yi</dc:creator>
  <dc:creator>Pant, Kapil</dc:creator>
  <dc:creator>Chen, Zhijian</dc:creator>
  <dc:creator>Wang, Guiren</dc:creator>
  <dc:creator>Diffey, William F.</dc:creator>
  <dc:creator>Ashley, Paul</dc:creator>
  <dc:creator>Sundaram, Shivshankar</dc:creator>
  <prism:publicationName>Microfluidics and Nanofluidics</prism:publicationName>
  <prism:issn>1613-4990</prism:issn>
  <prism:genre>OriginalPaper</prism:genre>
  <journalId>10404</journalId>
  <prism:volume>7</prism:volume>
  <prism:number>5</prism:number>
  <prism:startingPage>683</prism:startingPage>
  <openAccess>>false</openAccess>
  <prism:doi>10.1007/s10404-009-0428-3</prism:doi>
  <dc:publisher>Springer</dc:publisher>
  <prism:publicationDate>2009-10-31</prism:publicationDate>
  <prism:url>http://dx.doi.org/10.1007/s10404-009-0428-3</prism:url>
  <prism:copyright>©2009 Springer-Verlag</prism:copyright>
</pam:article>

</xhtml:head>
<xhtml:body>
  <h1>Abstract</h1>
  <p>The phenomenon of enrichment of charged analytes due to the presence of an electr
  <CitationRef
  CitationID="CR17">2005b</CitationRef>): (1) ion transport of background electrolytes (BGE) and (
  </p>
</xhtml:body>
</pam:message>

```

# meta API

- [http://api.springer.com/meta/v1/pam?q=journalid:11671%20openaccess:true&api\\_key=XX](http://api.springer.com/meta/v1/pam?q=journalid:11671%20openaccess:true&api_key=XX)

- General Elements

- (Same as metadata, except as below)
- Casper pdf and html urls
- issueType (Regular, Supplement)
- topicalCollection (ArticleCollection; e.g., topicalcollection:Topics in Flow Control)
- Can query with openaccess:True

```

    <pam:article>
      <dc:identifier>doi:10.1007/s11671-010-9562-9</dc:identifier>
      <prism:url format="html"
platform="web">http://link.springer.com/openurl/fulltext?id=doi:10.1007/s11671-010-9562-9<
      <prism:url format="pdf"
platform="web">http://link.springer.com/openurl/pdf?id=doi:10.1007/s11671-010-9562-9</prism:
      <dc:title>Template Synthesis of Carbon Nanofibers Containing Linear Mesocage<
      <dc:creator>Wang, Yongwen</dc:creator>
      <dc:creator>Zheng, Mingbo</dc:creator>
      <dc:creator>Lu, Hongling</dc:creator>
      <dc:creator>Feng, Shaoqing</dc:creator>
      <dc:creator>Ji, Guangbin</dc:creator>
      <dc:creator>Cao, Jieming</dc:creator>
      <prism:publicationName>Nanoscale Research Letters</prism:publicationName>
      <prism:issn>1556-276X</prism:issn>
      <prism:genre>Nano Express</prism:genre>
      <journalId>11671</journalId>
      <prism:volume />
      <prism:number />
      <issueType />
      <topicalCollection />
      <prism:startingPage>1</prism:startingPage>
      <openAccess>true</openAccess>
      <prism:doi>10.1007/s11671-010-9562-9</prism:doi>
      <dc:publisher>Springer</dc:publisher>
      <prism:publicationDate>2010-05-09</prism:publicationDate>
      <prism:url>http://dx.doi.org/10.1007/s11671-010-9562-9</prism:url>
      <prism:copyright>©2010 The Author(s)</prism:copyright>
    </pam:article>

</xhtml:head>
<xhtml:body>
  <h1>Abstract</h1>
  <p>Carbon nanofibers containing linear mesocage arrays were prepared via evaporat<
</xhtml:body>
</pam:message>

```



# xmldata/fulltext API => General Constraints

- Equals constraints

- **DOI:** [http://api.springer.com/xmldata/jats?q=doi:10.1007/s10741-007-9067-5&api\\_key=xx](http://api.springer.com/xmldata/jats?q=doi:10.1007/s10741-007-9067-5&api_key=xx)
- **Subject:** [http://api.springer.com/xmldata/jats?q=year:2011%20subject:Physics%20type:Journal&api\\_key=xx&p=5](http://api.springer.com/xmldata/jats?q=year:2011%20subject:Physics%20type:Journal&api_key=xx&p=5)
- **Keyword:** [http://api.springer.com/xmldata/jats?q=keyword:patients%20year:2016&api\\_key=xx&s=1&p=3](http://api.springer.com/xmldata/jats?q=keyword:patients%20year:2016&api_key=xx&s=1&p=3)
- **Pub:** [http://api.springer.com/xmldata/jats?q=pub:Extremes%20country:France%20type:Journal&api\\_key=xx&s=1&p=3](http://api.springer.com/xmldata/jats?q=pub:Extremes%20country:France%20type:Journal&api_key=xx&s=1&p=3)
- **Year:** [http://api.springer.com/xmldata/jats?q=year:2012&api\\_key=xx&s=1&p=3](http://api.springer.com/xmldata/jats?q=year:2012&api_key=xx&s=1&p=3)
- **Country:** [http://api.springer.com/xmldata/jats?q=pub:Extremes%20country:France%20type:Journal&api\\_key=xx&s=1&p=3](http://api.springer.com/xmldata/jats?q=pub:Extremes%20country:France%20type:Journal&api_key=xx&s=1&p=3)
- **ISBN:** [http://api.springer.com/xmldata/jats?q=isbn:978-3-642-77405-8&api\\_key=xx&s=1&p=3](http://api.springer.com/xmldata/jats?q=isbn:978-3-642-77405-8&api_key=xx&s=1&p=3)
- **ISSN:** [http://api.springer.com/xmldata/jats?q=issn:1432-2242%20JournalOnlineFirst:true&api\\_key=xx&s=1&p=3](http://api.springer.com/xmldata/jats?q=issn:1432-2242%20JournalOnlineFirst:true&api_key=xx&s=1&p=3)

# xmldata/fulltext API => General Constraints

- Equals constraints (cont'd)
  - **Volume, issue:**  
[http://api.springer.com/xmldata/jats?q=journal%3A%22Mindfulness%22%20volume%3A8%20issue%3A4&p=1&api\\_key=xx](http://api.springer.com/xmldata/jats?q=journal%3A%22Mindfulness%22%20volume%3A8%20issue%3A4&p=1&api_key=xx)
  - **Date:** [http://api.springer.com/xmldata/jats?q=date:2009-01-01&api\\_key=xx](http://api.springer.com/xmldata/jats?q=date:2009-01-01&api_key=xx)
  - **Type:**  
[http://api.springer.com/xmldata/jats?q=orgname:%22University%20of%20Scranton%22%20type:Journal&api\\_key=xx&p=5](http://api.springer.com/xmldata/jats?q=orgname:%22University%20of%20Scranton%22%20type:Journal&api_key=xx&p=5)
  - **Journalonlinefirst:** [http://api.springer.com/xmldata/jats?q=issn:1432-2242%20JournalOnlineFirst:true&api\\_key=xx&s=1&p=3](http://api.springer.com/xmldata/jats?q=issn:1432-2242%20JournalOnlineFirst:true&api_key=xx&s=1&p=3)

# xmldata/fulltext API

## Querying constraints

- doi
- journalid
- issn
- journal
- isbn
- book
- pub (publication)
- title
- name
- subject
- date
- year
- keyword
- type (Book or Journal)
- country
- JournalOnlineFirst (true or false)
- Orgname
- empty* (no constraint, general search)

- [http://api.springer.com/xmldata/jats?q=doi:10.1007/s11258-006-9242-0&api\\_key=xx](http://api.springer.com/xmldata/jats?q=doi:10.1007/s11258-006-9242-0&api_key=xx)
- [http://api.springer.com/xmldata/jats?q=journalid:270%20year:2017&api\\_key=xx&s=1&p=3](http://api.springer.com/xmldata/jats?q=journalid:270%20year:2017&api_key=xx&s=1&p=3)
- [http://api.springer.com/xmldata/jats?q=isbn:978-1-59259-559-4&api\\_key=xx&s=1&p=3](http://api.springer.com/xmldata/jats?q=isbn:978-1-59259-559-4&api_key=xx&s=1&p=3)
- Returns fulltext JATS xml as available; for internal use (except as indicated elsewhere).

```

</ChapterHeader>
<Body>
  <Section1 ID="Sec1">
    <Heading>Introduction</Heading>
    <Para
to a thorough analysis of the industrial needs and of the limitations of current simulation
    <CitationRef CitationID="CR1">1</CitationRef>], which represents the thermal-
this comprehensive program, aims at building a new software platform for advanced two-phase
tions meeting the industrial needs. The different modeling strategies can be taken into ac
    </Para>
    <Para
er consists of a general presentation of the model implemented in NEPTUNE_CFD code, origina
    </Section1>
  <Section1 ID="Sec2">
    <Heading>Multi-Fluid Volume Averaged Models</Heading>
    <Section2 ID="Sec3">
      <Heading>General Equations</Heading>
      <Para
mid volume averaged models play a central role for numerically handling multi-phase flows h
ds to a set of separate mean balance equations for each phase [
        <CitationRef CitationID="CR2">2</CitationRef>,
        <CitationRef
CitationRef>] which looks like to the single-phase conservation equations of mass, momentu
      </Para>
    </Section2>
  </Section1>

```



# near query

- The purpose of the “near” query is to find terms within x number of words from each other. In the highlighted case, we use “engineering” which can have many meanings and contexts:

- The “engineering NEAR/3 locomotive” API call

[http://api.springer.com/xmldata/jats?q=engineering%20NEAR/3%20locomotive&api\\_key=xxxxxxxxxxxxx  
xxxxxxxxxxxxxxxxxxxxxxxx&p=5](http://api.springer.com/xmldata/jats?q=engineering%20NEAR/3%20locomotive&api_key=xxxxxxxxxxxxx<br/>xxxxxxxxxxxxxxxxxxxxxxxx&p=5)

yields four results where “engineering is within 3 words of “locomotive” which is what was specified in the API call.

- The “engineering NEAR/5 metals” API call

[http://api.springer.com/xmldata/jats?q=engineering%20NEAR/5%20metals&api\\_key=xxxxxxxxxxxxxxxxx  
xxxxxxxxxxxxxxxxxxx&p=5](http://api.springer.com/xmldata/jats?q=engineering%20NEAR/5%20metals&api_key=xxxxxxxxxxxxxxxxx<br/>xxxxxxxxxxxxxxxxxxx&p=5)

yields four results where “engineering is within 5 words of “metals”.

# JATS API

Industry standard XML schema. Development completed May 2017 for journals and books.

```

<records>
  <article article-type="research-article" dtd-version="1.1" xml:lang="en">
    <front>
      <journal-meta>
        <journal-id journal-id-type="publisher-id">11583</journal-id>
        <journal-title-group>
          <journal-title>Il Nuovo Cimento Series 10</journal-title>
          <abbrev-journal-title abbrev-type="publisher">Nuovo Cim</abbrev-journal-title>
        </journal-title-group>
        <issn pub-type="ppub">0029-6341</issn>
        <issn pub-type="epub">1827-6121</issn>
        <publisher>
          <publisher-name>Società Italiana di Fisica</publisher-name>
          <publisher-loc>Bologna</publisher-loc>
        </publisher>
        <custom-meta-group>
          <custom-meta>
            <meta-name>toc-levels</meta-name>
            <meta-value>0</meta-value>
          </custom-meta>
          <custom-meta>
            <meta-name>volume-type</meta-name>
            <meta-value>Regular</meta-value>
          </custom-meta>
          <custom-meta>
            <meta-name>journal-subject-primary</meta-name>
            <meta-value>Physics</meta-value>
          </custom-meta>
          <custom-meta>
            <meta-name>journal-subject-secondary</meta-name>
            <meta-value>Physics, general</meta-value>
          </custom-meta>
        </custom-meta-group>
      </journal-meta>
    </front>
  </article>
</records>

```

# Citations APIs (for Journal Articles)

- Article/chapter count: returns the number of citations for a given DOI
  - <http://citationsapi.nkb3.org/article/citations/count?doi=10.1007/s00216-007-1222-2>
- Show citations: returns actual citations for a given DOI.
  - <http://citationsapi.nkb3.org/article/citations?doi=10.1007/s00216-007-1222-2>

```
- <citation-count-result>
  <doi>10.1007/s00216-007-1222-2</doi>
  <citation-count>23</citation-count>
</citation-count-result>
```

- Data for citations APIs comes from the responses to requests we make to Crossref to find out who is citing our data.

```
- <citation>
  <target_doi>10.1007/s00216-007-1222-2</target_doi>
  - <journal_cite fl_count="0" submissionId="" datetimeReceived="2014-07-15T22:23:36.619273+02:00">
    <issn type="print">0028-8233</issn>
    <issn type="electronic">1175-8775</issn>
    <journal_title>New Zealand Journal of Agricultural Research</journal_title>
    <journal_abbreviation>New Zealand Journal of Agricultural Research</journal_abbreviation>
  - <article_title>
    Analysis of major fatty acids in milk produced from high-quality grazed pasture
  </article_title>
  - <contributors>
    - <contributor first-author="true" sequence="first" contributor_role="author" citation_formatted_name="I, Rugoho">
      <given_name>I</given_name>
      <surname>Rugoho</surname>
    </contributor>
    - <contributor first-author="false" sequence="additional" contributor_role="author" citation_formatted_name="Y, Liu">
      <given_name>Y</given_name>
      <surname>Liu</surname>
    </contributor>
    - <contributor first-author="false" sequence="additional" contributor_role="author" citation_formatted_name="Dewhurst, RJ">
      <given_name>RJ</given_name>
      <surname>Dewhurst</surname>
    </contributor>
  </contributors>
  <first_page>1</first_page>
  <year>2014</year>
  <publication_type>full_text</publication_type>
  <doi type="journal_article">10.1080/00288233.2014.899505</doi>
```

# Citations APIs (for Book Chapters and Journals)

- Book-level count: returns total count of citations for all the chapters in a book.
  - <http://citationsapi.springerservice.com/book/citations/count?doi=10.1007/978-3-642-24040-9>
- Journal-level count: returns total count of citations for all the articles in a journal.
  - <http://citationsapi.springerservice.com/journal/367/citations/count>
- Citations Combination Count and Display Book API:
  - <http://citationsapi.springerservice.com/book/citations?doi=10.1007/978-3-540-30299-5&s=51&p=20>

```
- <citation-count-result>
  <doi>10.1007/978-3-642-24040-9</doi>
  <citation-count>17</citation-count>
</citation-count-result>
```

```
- <citation-count-result>
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    <surname>Ebert</surname>
  </contributor>
</citations-result>
```

# Citations APIs

- Recent citations: live feed receiving daily Crossref data; not just about recent Springer Nature articles; this is about ANY new article citing (/citation) a Springer Nature article (/item) from any time.
- [http://citations.springer.com/xml/recent\\_citations/2015-02-03?start=1&end=10](http://citations.springer.com/xml/recent_citations/2015-02-03?start=1&end=10)
- [http://citations.springer.com/xml/recent\\_citations/2015-02-03?maxResults=10](http://citations.springer.com/xml/recent_citations/2015-02-03?maxResults=10)

```
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<article_title>On the complexity of average path length for biological networks and
```

# Search on a Portal

- User runs search on portal, e. g. *hip cartilage*
  - Though the user is searching the portal our API is being called and the results are returned on the fly.

## Clinical Orthopaedics and Related Research

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### Search results

660 results found



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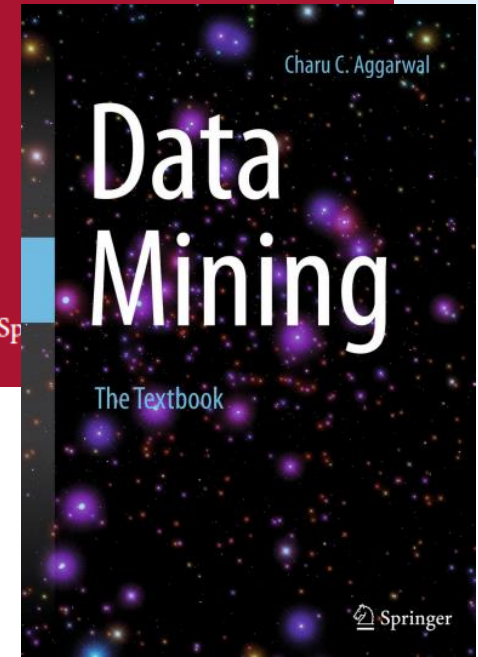
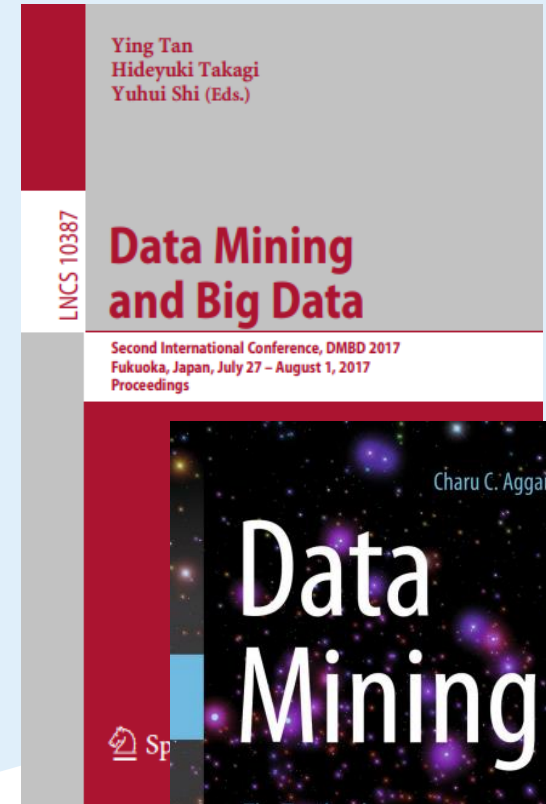
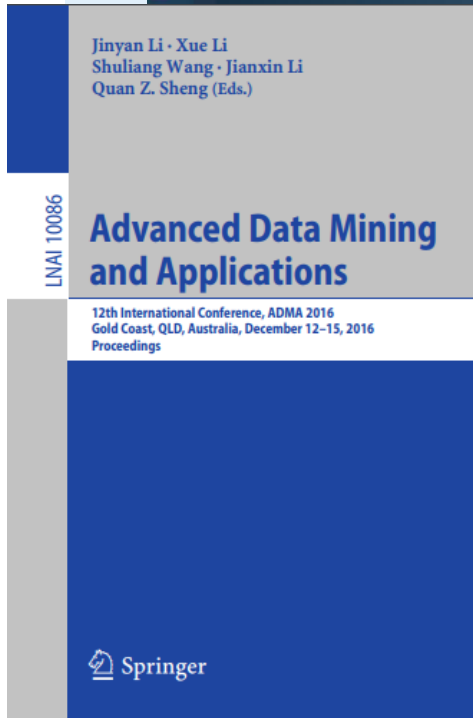


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# Thank you!

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