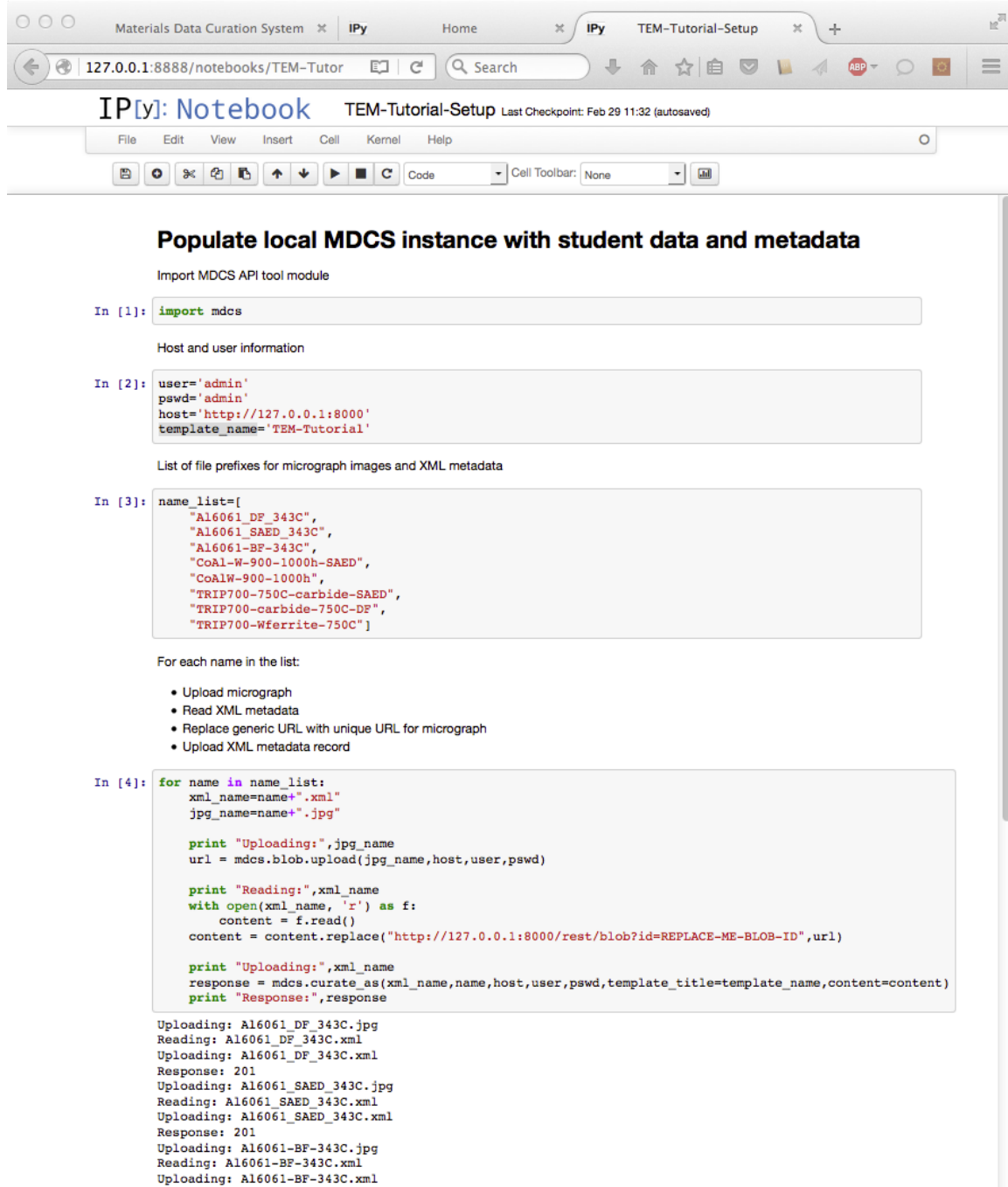


Data Exploration: Simple TEM Tutorial

Upload past student data

To synthesize student usage in the past, execute the IPython (Jupyter) Notebook “TEM-Tutorial-Setup”:



Populate local MDCS instance with student data and metadata

Import MDCS API tool module

```
In [1]: import mdcs
```

Host and user information

```
In [2]: user='admin'
pswd='admin'
host='http://127.0.0.1:8000'
template_name='TEM-Tutorial'
```

List of file prefixes for micrograph images and XML metadata

```
In [3]: name_list=[
    "Al6061_DF_343C",
    "Al6061_SAE3_343C",
    "Al6061-BF-343C",
    "CoAl-W-900-1000h-SAE3",
    "CoAlW-900-1000h",
    "TRIP700-750C-carbide-SAE3",
    "TRIP700-carbide-750C-DF",
    "TRIP700-Wferrite-750C"]
```

For each name in the list:

- Upload micrograph
- Read XML metadata
- Replace generic URL with unique URL for micrograph
- Upload XML metadata record

```
In [4]: for name in name_list:
    xml_name=name+".xml"
    jpg_name=name+".jpg"

    print "Uploading:",jpg_name
    url = mdcs.blob.upload(jpg_name,host,user,pswd)

    print "Reading:",xml_name
    with open(xml_name, 'r') as f:
        content = f.read()
        content = content.replace("http://127.0.0.1:8000/rest/blob?id=REPLACE-ME-BLOB-ID",url)

    print "Uploading:",xml_name
    response = mdcs.curate_as(xml_name,name,host,user,pswd,template_title=template_name,content=content)
    print "Response:",response
```

Uploading: Al6061_DF_343C.jpg
Reading: Al6061_DF_343C.xml
Uploading: Al6061_DF_343C.xml
Response: 201
Uploading: Al6061_SAE3_343C.jpg
Reading: Al6061_SAE3_343C.xml
Uploading: Al6061_SAE3_343C.xml
Response: 201
Uploading: Al6061-BF-343C.jpg
Reading: Al6061-BF-343C.xml
Uploading: Al6061-BF-343C.xml

Explore Student TEM Data by Student Name

1: From the MDCS homepage, click on “Data Exploration” then click on “Search by Keyword”:

The screenshot shows the Materials Data Curation System (MDCS) homepage. The browser address bar displays '127.0.0.1:8000/explore/'. The page header includes the title 'Materials Data Curation System' and a welcome message 'Welcome, admin. Thanks for logging in.' with links for 'Logout', 'My Profile', and 'Help'. The main navigation bar contains 'Home', 'Data Curation', 'Data Exploration', and 'Composer'. The 'Data Exploration' link is highlighted with a red circle. Below the navigation bar, there are two options: 'Query by Example' and 'Search by Keyword', with the latter also highlighted by a red circle. The 'Search by Keyword' option leads to the 'Select Template' page. This page includes instructions on how to select a template and a table of 'Global Templates'. The table lists a template named 'TEM-Tutorial' with the file name 'workshop-TEM.xsd' and is marked as the 'Current template'. Below this, there is a section for 'User Defined Templates' with a note about creating templates using the 'Composer'.

Materials Data Curation System

Welcome, admin. Thanks for logging in.

Logout | My Profile | Help

Home | Data Curation | **Data Exploration** | Composer

Query by Example | **Search by Keyword**

Select Template

Select a template from the following table. Once you make your selection, click on "Select Fields" to proceed. It will automatically load the appropriate form and display it on the next page.

Global Templates

Template name	File name	Actions
TEM-Tutorial	workshop-TEM.xsd	Current template

User Defined Templates

Create your own templates using the [Composer](#) and you will be able to use them from this section.

Home | Data Curation | Data Exploration | Composer | Contact

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Website template by Arcsin

2: Search for all records under student name “Smith”:

The screenshot shows a web browser window with the address bar displaying "127.0.0.1:8000/explore/keyword". The page title is "Materials Data Curation System" with a subtitle "Welcome, admin. Thanks for logging in." The navigation bar includes links for "Home", "Data Curation", "Data Exploration", and "Composer". The "Data Exploration" section is active, showing "Query by Example" and "Search by Keyword" tabs. The "Search by Keyword" tab is selected, displaying a search input field with the text "Smith" and a search button. Below the search field, there are two results listed:

- ☐ [CoAlW-900-1000h](#) TEM-Tutorial
- ☐ [CoAl-W-900-1000h-SAED](#) TEM-Tutorial

The footer contains copyright information: "© 2012 - 2016 Materials Data Curation System | Privacy Policy | Terms of Use | Administration" and a link to "Website template by Arcsin".

3: Expand “CoAlW-900-1000h”:

The screenshot shows a web browser window with the address bar displaying "127.0.0.1:8000/explore/keyword". The page title is "Materials Data Curation System" with a subtitle "Welcome, admin. Thanks for logging in." and navigation links for "Logout", "My Profile", and "Help". The main navigation bar includes "Home", "Data Curation", "Data Exploration", and "Composer". The "Data Exploration" section is active, showing "Query by Example" and "Search by Keyword".

On the left, the "Current template" section shows a checked box for "TEM-Tutorial". The main content area is titled "Search by keyword" and features a search input field containing "Smith" with a magnifying glass icon and an "Export" button. Below the search bar, it indicates "2 results".

The first result is "CoAlW-900-1000h" with a "TEM-Tutorial" icon and a red "X" icon. It is categorized under "measurement" and expanded to show a hierarchical structure:

- core**
 - title : TEM Measurement of Co-11W-9.4Al
 - contactPoint**
 - fn : John Smith
 - hasEmail : data@nist.gov
 - keyword : TEM
- material**
 - quantity-unit : mole percent
 - composition**
 - constituent**
 - element : Co
 - quantity : 79.6
 - purity : 1
 - error : 0
 - constituent**
 - element : W
 - quantity : 11
 - purity : 1

4: Scroll to bottom of metadata record, highlight the download URL of supporting file, right-click and select “Open Link”:

The screenshot displays the Materials Data Curation System interface. The browser address bar shows the URL `127.0.0.1:8000/explore/keyword`. The main content area shows a metadata record for **CoAlW-900-1000h**. The metadata is organized into a tree view on the left, with fields such as **element**, **quantity**, **purity**, **error**, **constituent**, **phases**, **anneal**, **time**, **temperature**, **transmission-electron-microscopy**, **instrument-ID**, **imaging-mode**, **accelerating-voltage**, and **supporting-files**. The **supporting-files** section shows a file named **CoAlW-900-1000h-SAED TEM-Tutorial** with a download URL: `http://127.0.0.1:8000/rest/blobs?id=56d472911813cd10fb66b04`. A Firefox dialog box is open, asking the user to open the file with Preview (default) or save it. The dialog box also includes a checkbox for "Do this automatically for files like this from now on." and buttons for "Cancel" and "OK".

Materials Data Curation System

127.0.0.1:8000/explore/keyword

Search

CoAlW-900-1000h.jpg — Locked

CoAlW-900-1000h.jpg

Opening CoAlW-900-1000h.jpg

You have chosen to open:

CoAlW-900-1000h.jpg

which is: Preview.app Document

from: `http://127.0.0.1:8000`

What should Firefox do with this file?

☒ Open with Preview (default)

☐ Save File

☐ Do this automatically for files like this from now on.

Cancel OK

Home | Data Curation | Data Exploration | Composer | Contact

Top ^

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127.0.0.1:8000/explore

Explore all TEM records containing Silicon and narrow by Bright Field

1: Search by keyword “Si”

The screenshot shows a web browser window with the URL `127.0.0.1:8000/explore/keyword`. The page title is "Materials Data Curation System" with a welcome message for "admin". The navigation bar includes "Home", "Data Curation", "Data Exploration", and "Composer". The "Data Exploration" section is active, showing "Query by Example" and "Search by Keyword". The "Search by keyword" section has a search bar containing "Si" and a magnifying glass icon. A "Export" button is visible. Below the search bar, 6 results are listed, each with a checkbox, a link to a TEM-Tutorial, and a red 'X' icon. The results are:

- ☐ [TRIP700-Wferrite-750C](#) TEM-Tutorial
- ☐ [TRIP700-carbide-750C-DF](#) TEM-Tutorial
- ☐ [TRIP700-750C-carbide-SAED](#) TEM-Tutorial
- ☐ [Al6061-BF-343C](#) TEM-Tutorial
- ☐ [Al6061_SAED_343C](#) TEM-Tutorial
- ☐ [Al6061_DF_343C](#) TEM-Tutorial

The footer contains navigation links: "Home", "Data Curation", "Data Exploration", "Composer", and "Contact". It also includes copyright information: "© 2012 - 2016 Materials Data Curation System | Privacy Policy | Terms of Use | Administration" and a note: "Website template by Arcsin".

2: Add keyword of “bright field”

The screenshot shows a web browser window with the address bar displaying `127.0.0.1:8000/explore/keyword`. The page title is "Materials Data Curation System" with a subtitle "Welcome, admin. Thanks for logging in." The navigation bar includes links for "Home", "Data Curation", "Data Exploration", and "Composer". The "Data Exploration" section is active, showing "Query by Example" and "Search by Keyword" options. The "Search by keyword" section displays a search bar with the query "si" and "bright field". Below the search bar, there are two results:

- ☐ [TRIP700-Wferrite-750C](#) TEM-Tutorial
- ☐ [Al6061-BF-343C](#) TEM-Tutorial

The footer contains the copyright notice "© 2012 - 2016 Materials Data Curation System" and links for "Privacy Policy", "Terms of Use", and "Administration". The website template is credited to "Arcsin".

3: Expand “TRIP700-Wferrite-750C” and download micrograph

Materials Data Curation System

127.0.0.1:8000/explore/keyword

Search

- quantity : 0.007
- purity : 1
- error : 0.0001
- constituent
 - element : N
 - quantity : 0.0053
 - purity : 1
 - error : 0.0001
- phases : Widmanstätten
- anneal
 - time
 - value : 4
 - value : 4
 - value : 2
 - value : 2
 - unit : h
 - temperature
 - value : 350
 - value : 500
 - value : 600
 - value : 750
 - unit : C
- transmission-electron-microscopy
 - instrument-ID : FEI-Titan
 - imaging-mode : Bright Field
 - accelerating-voltage
 - value : 300
 - unit : kV
 - supporting-files
 - file
 - downloadURL : <http://127.0.0.1:8000/rest/blob?id=56d472921813cd10fb16eb0d>

AI6061-BF-343C TEM-Tutorial

Home | Data Curation | Data Exploration | Composer | Contact

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Website template by Arcsin

TRIP700-Wferrite-750C.jpg

Opening TRIP700-Wferrite-750C.jpg

You have chosen to open:

TRIP700-Wferrite-750C.jpg
which is: Preview.app Document
from: <http://127.0.0.1:8000>

What should Firefox do with this file?

☒ Open with Preview (default)

☐ Save File

☐ Do this automatically for files like this from now on.

Cancel OK