Materials data platform
DICE

Data management and adoption of the FAIR principle; perspective from a research institution

NATIONAL INSTITUTE FOR MATERIALS SCIENCE (NIMS)

MATERIALS DATA PLATFORM CENTER (DPFC)

MIKIKO TANIFUJI, MANAGING DIRECTOR

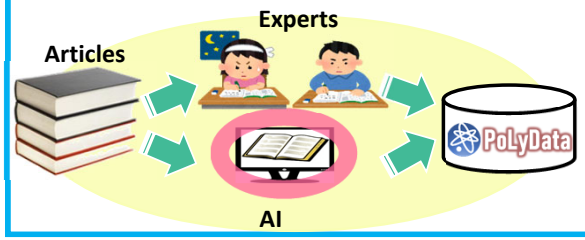
2021.6.18

MaDIS NIMS

Research Data Platform, DICE – Starting 2020

Create

Public Knowledge Data



Experimental Data

M-DaC

Raw data, metadata

Conversion to Machine-readable, Machine-comprehensive data

ML

ML

Store

Findable
Accessible Readable
& Reusable
Interoperable

Big scale data processing clusters

10PB/0.5PFLOPS
(NIMS, Tsukuba)

Applications & Tools

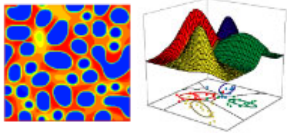
AI

Use

R&D

解析　評価　予測

物性選択　材料選択



Government institutes, Universities, Industries

Publish

Publish data with DOI via data repository

MDR MATERIALS DATA REPOSITORY

Share data under research schemes

MDR MATERIALS DATA REPOSITORY

MDR Shared

Peer-review journal

STAM Methods

A sister journal of STAM (IF5.8)

Register to global databases

研究データをつくる･ためる･つかう、とは？

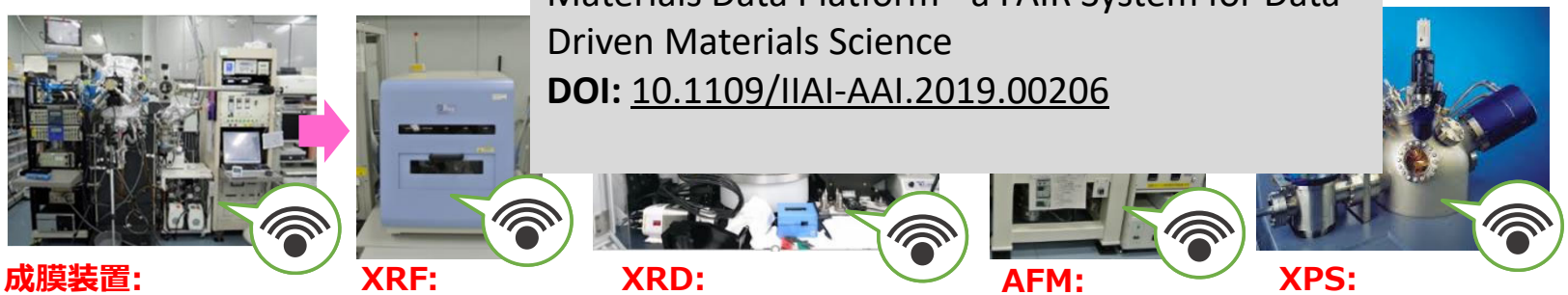
English version is not supported.

RDE RESEARCH DATA EXPRESS　NIMS

'15 公開開始　所内公開

- **測ったそばから使える形でためる！**

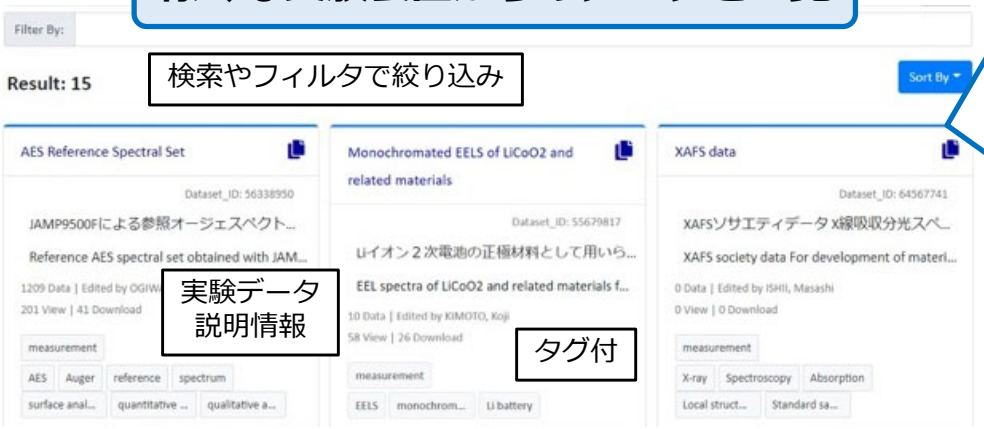
For details:
Materials Data Platform - a FAIR System for Data-Driven Materials Science
DOI: 10.1109/IIAI-AAI.2019.00206

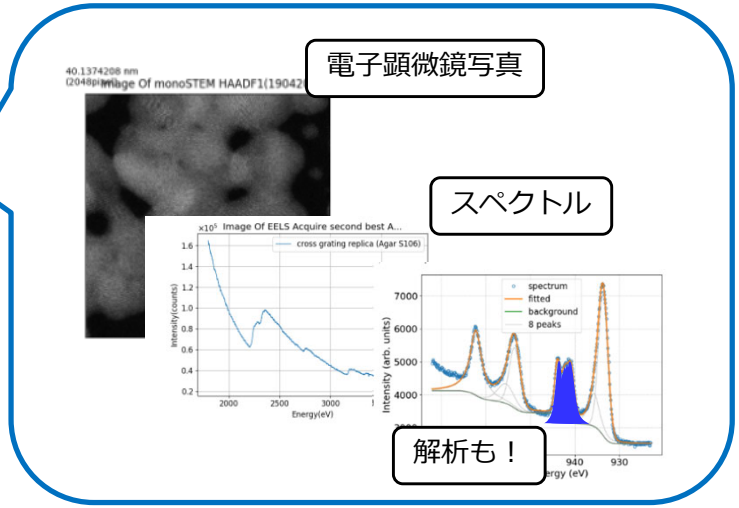


成膜装置: 新材料の合成
XRF: 元素組成の分析
XRD: 結晶構造の分析
AFM: 表面形状の分析
XPS: 化学種の分析

データ構造化・登録システム

様々な実験装置からのデータを一覧

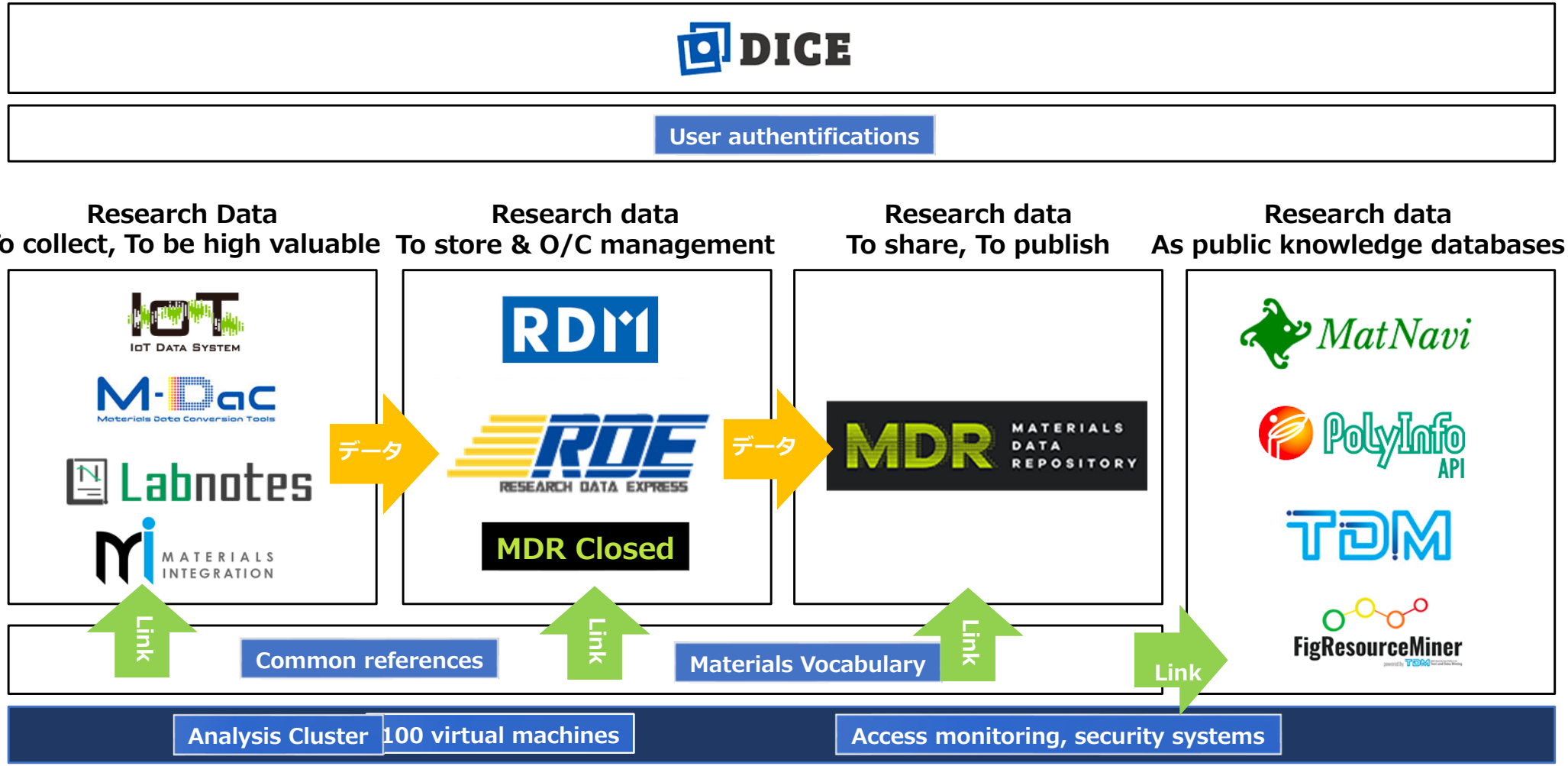




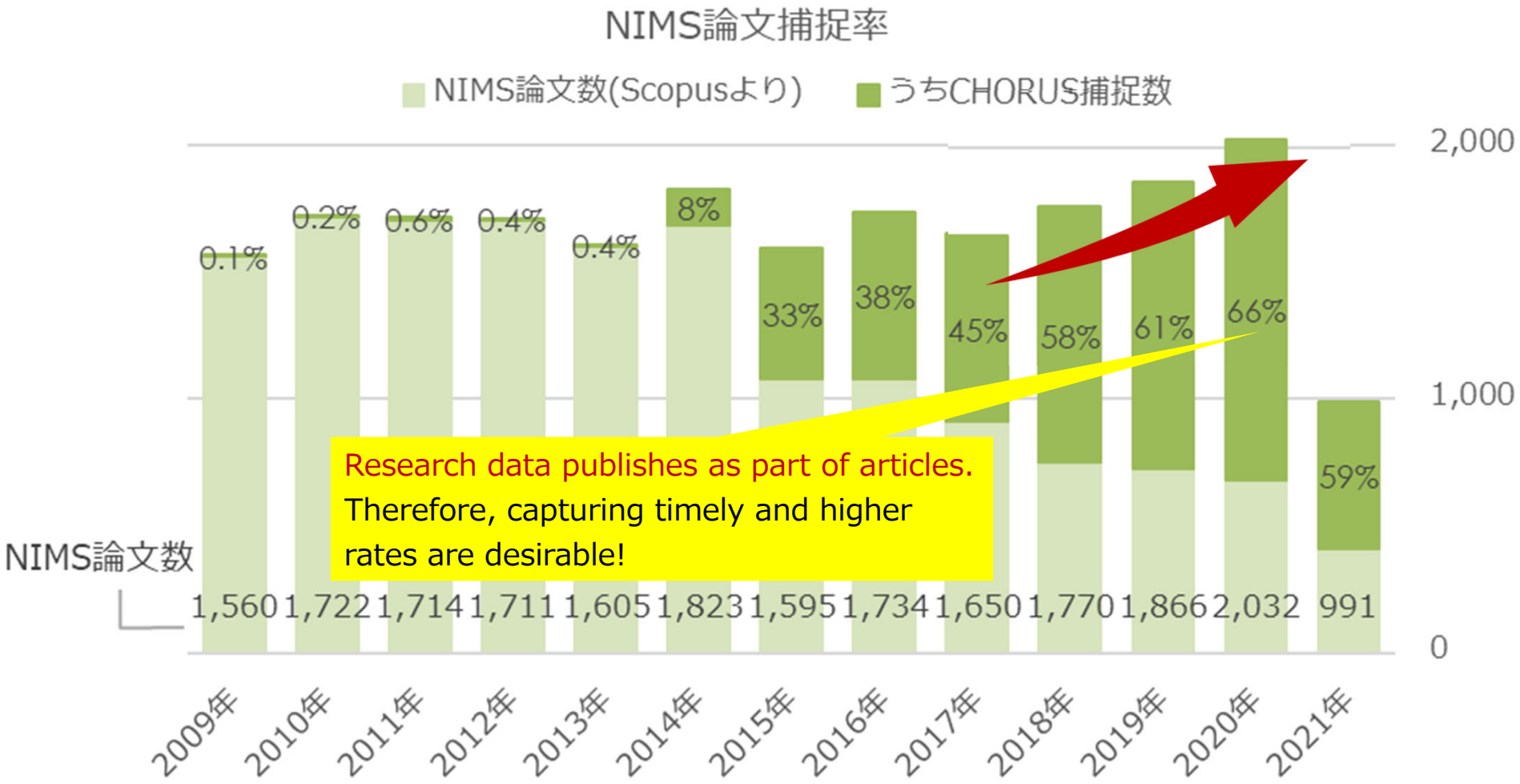
実例：
- 3次元アトムプローブのFIB加工条件の記録
- コンビナトリアル法によって合成した組成傾斜膜の蛍光Ｘ線分析による組成分布画像の記録

論文：
”IoT データ収集システムのデータアーキテクチャ” 情報処理学会論文誌デジタルプラクティス (2021)

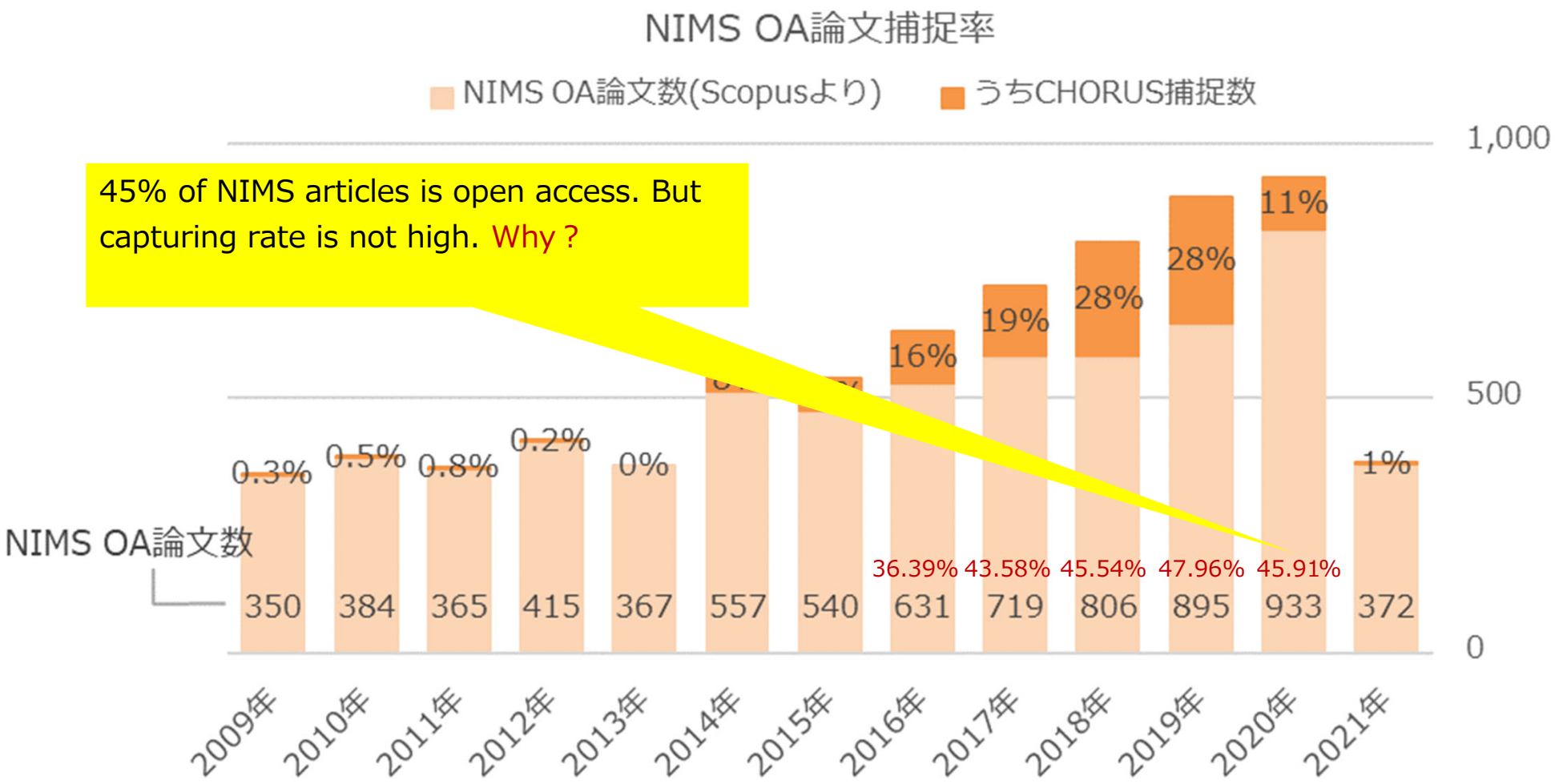
DICE Data Services – to use – by FAIRable



What we see by CHORUS – capture rates of articles



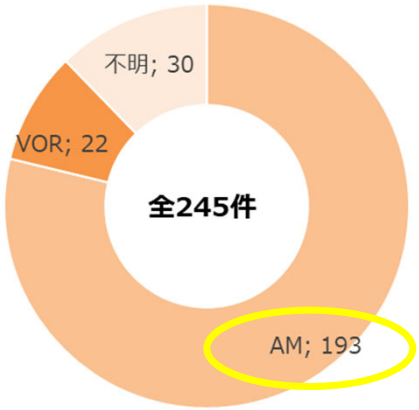
What we see by CHORUS – Capturing Open Access is not high.



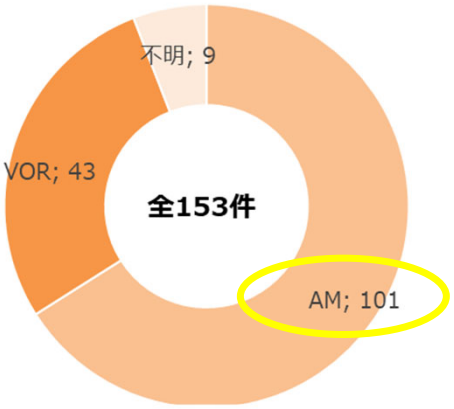
What we see by CHORUS – VOR vs AM

VOR: Version of Record（出版社版）、AM: Author Manuscript（著者版）

American Physical Society



Elsevier

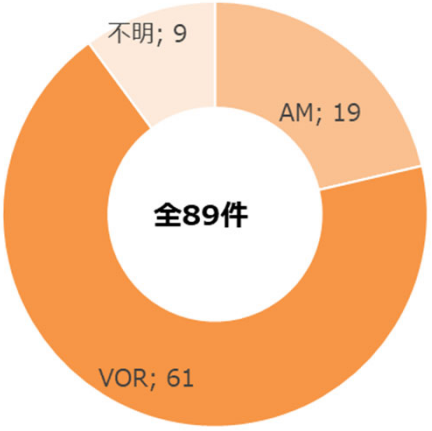


Among top 5 publishers, AM is well distributed
APS（No.1）と Elsevier（No.2）.
Appreciated publishers who supports authors versions with DOI distributions (so that we can capture via CHORUS).

Wiley

American Chemical Society

The Royal Society of Chemistry



What we see by CHORUS – Data sets

	2021年2月	2021年6月
NIMS articles	5,747	**6,176**
No of data sets in articles	97	**96**
No of DOI of data sets	242	**232**
CCDC ＆Fiz Karlsruhe	212	**207**
Zenodo	9	**16**
figshare	4	**5**
その他	5 ※1	**4** ※2
Crossref	12	**0**

See the next

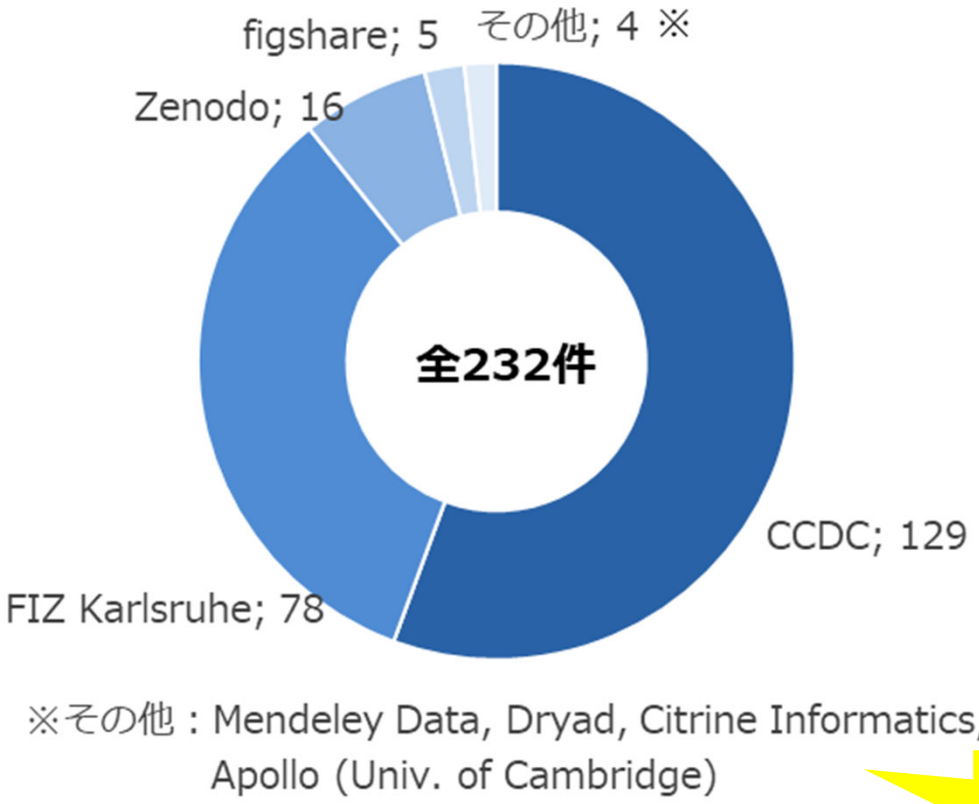
All are the DOIs of articles (not data sets;)

※1 : Mendeley Data, Dryad, Citrine Informatics, Apollo (Univ. of Cambridge), CXIDB: Coherent X-ray Imaging Data Bank

※2 : Mendeley Data, Dryad, Citrine Informatics, Apollo (Univ. of Cambridge)

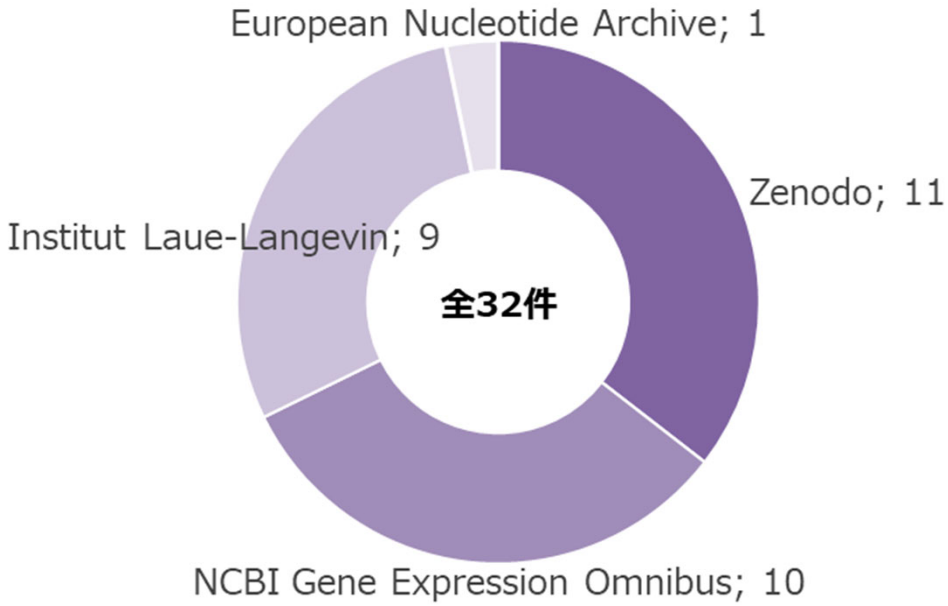
What we see by CHORUS – Data sets for scientific use! – The most important reason.

CHORUS: breakdown use of data sets with articles



※その他：Mendeley Data, Dryad, Citrine Informatics, Apollo (Univ. of Cambridge)

Reference : Web of Science: Data Citation Index (DCI) NIMS data sets indexed in databases, repositories



Research data are often indexed in data catalogues and database (ex. CCDC) that are very important FAIR channels as truly useful data resources.

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Acknowledgement :
Many thanks to Ms. Chie Onodera, a Digital Librarian at NIMS Library.
Our ideas come from day-to-day wondering, "Why? How?? Still … But!",
And we are still moving on towards Materials DX.

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