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「学術分野のデジタルドキュメント」

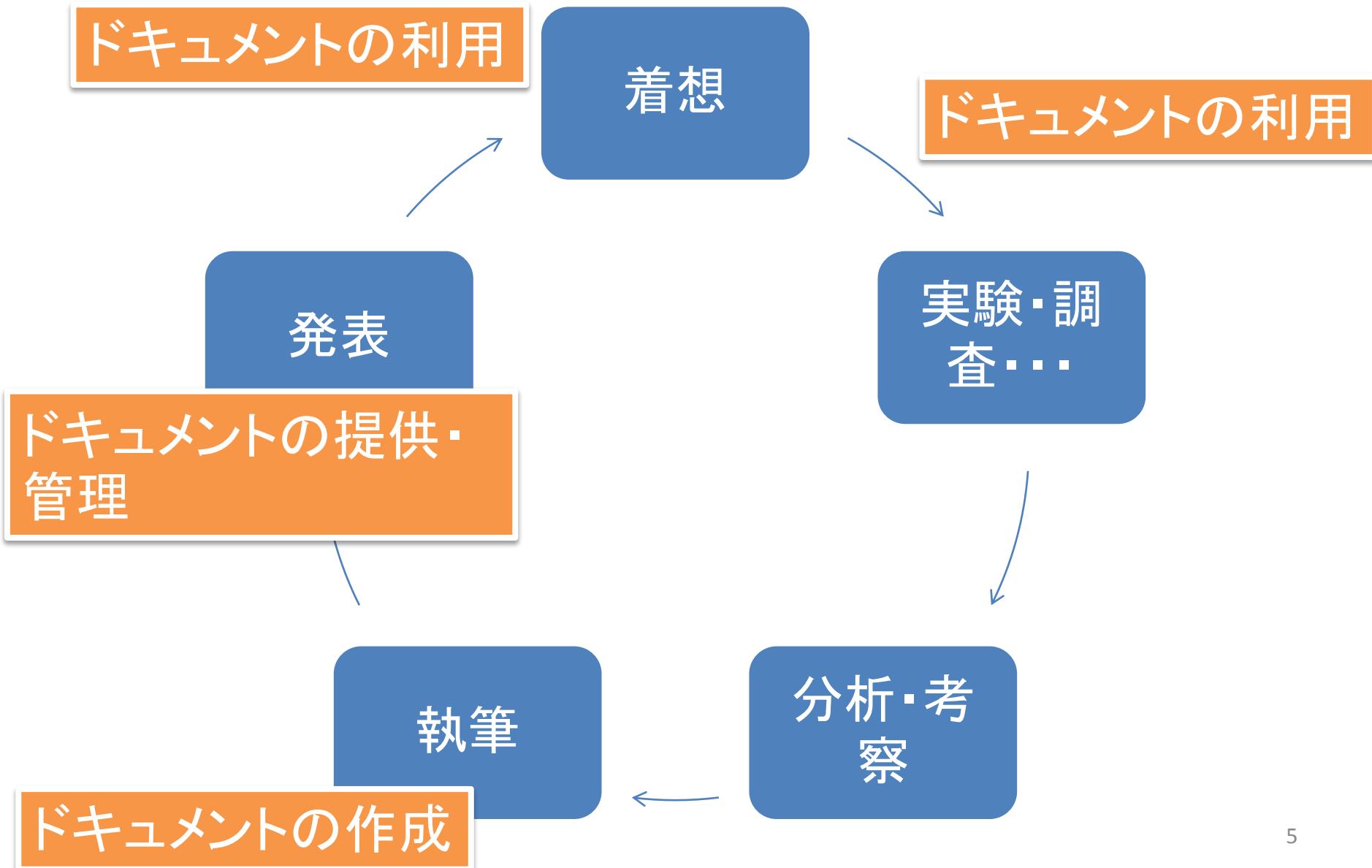
- 学術情報流通
 - 文献をベースにしたライフサイクル
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- オンラインジャーナル普及の歴史
- 学術論文の構造

学術分野のデジタルドキュメント

学術分野のデジタルドキュメント

- 科学研究: 新しい発見、知見を伝える営み
- 刊行された文書(論文)メディアを通じた相互理解と情報流通
- 実際の例
 - 雑誌論文 ≈ もっとも普遍的な学術文献。
 - 査読プロセス
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学術情報のライフサイクル



26 August 2011 | \$10

Science



HAYABUSA

Dust from Itokawa

『Science』誌
2011年8月26日号

<http://www.sciencemag.org/content/333/6046.cover-expansion>

Itokawa Dust Particles: A Direct Link Between S-Type Asteroids and Ordinary Chondrites

Tomoki Nakamura,^{1,*} Takaaki Noguchi,² Masahiko Tanaka,³ Michael E. Zolensky,⁴ Makoto Kimura,² Akira Tsuchiyama,⁵ Aiko Nakato,¹ Toshihiro Ogami,¹ Hatsumi Ishida,¹ Masayuki Uesugi,⁶ Toru Yada,⁶ Kei Shirai,⁶ Akio Fujimura,⁶ Ryuji Okazaki,⁷ Scott A. Sandford,⁸ Yukihiro Ishibashi,⁶ Masanao Abe,⁶ Tatsuaki Okada,⁶ Munetaka Ueno,⁶ Toshifumi Mukai,⁶ Makoto Yoshikawa,⁶ Junichiro Kawaguchi⁶

The Hayabusa spacecraft successfully recovered dust particles from the surface of near-Earth asteroid 25143 Itokawa. Synchrotron-radiation x-ray diffraction and transmission and scanning electron microscope analyses indicate that the mineralogy and mineral chemistry of the Itokawa dust particles are identical to those of thermally metamorphosed LL chondrites, consistent with spectroscopic observations made from Earth and by the Hayabusa spacecraft. Our results directly demonstrate that ordinary chondrites, the most abundant meteorites found on Earth, come from S-type asteroids. Mineral chemistry indicates that the majority of regolith surface particles suffered long-term thermal annealing and subsequent impact shock, suggesting that Itokawa is an asteroid made of reassembled pieces of the interior portions of a once larger asteroid.

The Hayabusa spacecraft arrived at S(IV)-type asteroid 25143 Itokawa (formerly 1998 SF36) in September 2005 (1). Remote-sensing measurements from the spacecraft suggest that Itokawa consists of rocks similar to LL5 and LL6 ordinary chondrites (2, 3), confirming ground-based spectral characterization (4). On 20 and 26 November 2005, the spacecraft descended to touchdown and capture dust particles from MUSES-C Regio. This area consists of dust and gravel deposits dominated by grains up to 1 cm in diameter (5). Although the sampler did not operate as planned, an elastic sampling horn impacted onto the asteroid surface, directing dust particles into the spacecraft's sample catcher device (5). The Hayabusa sample capsule successfully landed in the Woomera Prohibited Area in South Australia on 13 June 2010. Dust particles collected at the second touchdown were recovered by two methods. In one method, we used a Teflon spatula to sweep particles from about 10% of the surface of a sample catcher. In the other method, we gently tapped on the exterior of the sample catcher, causing particles to drop onto a pure silica glass slide (6).

On the Teflon spatula, we identified 1534 rocky particles by means of a field-emission scanning electron microscope. The particles have diameters ranging from 3 to 40 μm but are mostly smaller than 10 μm (7). Most Itokawa particles are angular and are probably broken pieces of larger rocks. Among the 1534 harvested rocky particles, 1087 are monomineralic, including 580 olivine particles, 126 low-Ca pyroxenes, 56 high-Ca pyroxenes, 186 feldspars (172 plagioclase and 14 K-feldspar), 113 troilites, 13 chromites, 10 Ca phosphates, and 3 Fe-Ni metal

grains. The remaining 447 particles are polymimetic mixtures, mainly silicates. Several other particles are silica minerals and K-bearing halite, all of uncertain origin.

Of the 40 particles removed by tapping (diameters ranging from 30 to 180 μm) that were analyzed by x-ray computed micromotography (7) and x-ray diffraction, 38 were subjected to more detailed mineralogical analysis. Backscattered electron images of selected particles are shown in Fig. 1, A to D. RA-QD02-0030 (Fig. 1A) and RA-QD02-0024 (Fig. 1B) have a platy morphology, are polymimetic, and have many mineral grains 1 to 10 μm in diameter adhering to their surfaces. Their appearance is typical of most Itokawa particles. Two particles show different morphologies. RA-QD02-0013 (Fig. 1C) has a smoother soccer-ball shape, whereas RA-QD02-0027 (Fig. 1D) consists of a large troilite crystal and smaller silicates. Particles that contain troilite or taenite as major components like RA-QD02-0027 are rare.

Mineralogical analysis of individual "tapped" particles indicates that they consist mainly of coarse (typically 10 to 50 μm in diameter (7)) crystalline silicates, the most abundant being olivine. The next most abundant minerals are low- and high-Ca pyroxene and plagioclase (fig. S6A). Low-Ca pyroxene is exclusively composed of orthopyroxene, except for RA-QD02-0060, which is dominated by low-Ca clinopyroxene (monoclinic structure was confirmed by x-ray diffraction). The degree of crystallinity of silicates differs between and within particles, particularly for plagioclase. Some particles contain chromite, chlorapatite, merrillite, and troilite up to 25 μm in size. Small inclusions (up to 10 μm) of taenite, kamacite, troilite, and

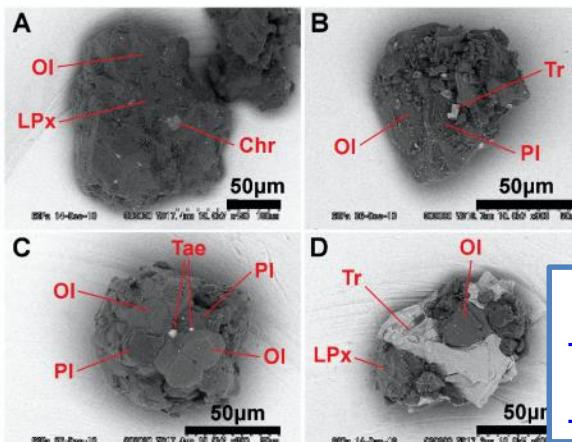


Fig. 1. (A to D) Backscattered electron (BSE) images of RA-QD02-0030 (A), RA-QD02-0024 (B), RA-QD02-0013 (C), and RA-QD02-0027 (D).

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論文の実例(1)

Tomoki Nakamura, Takaaki Noguchi, Masahiko Tanaka, et al.: “Itokawa Dust Particles: A Direct Link Between S-Type Asteroids and Ordinary Chondrites”. *Science*, Vol.333, No.6046, 2011, p.1113-1116.

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REPORT

Itokawa Dust Particles: A Direct Link Between S-Type Asteroids and Ordinary Chondrites

Tomoki Nakamura^{1,*}, Takaaki Noguchi², Masahiko Tanaka³, Michael E. Zolensky⁴, Makoto Kimura², Akira Tsuchiyama⁵, Aiko Nakato¹, Toshihiro Ogami¹, Hatsumi Ishida¹, Masayuki Uesugi⁵, Toru Yada⁵, Kei Shirai⁵, Akio Fujimura⁶, Ryuji Okazaki⁷, Scott A. Sandford⁸, Yukihiro Ishibashi⁸, Masanao Abe⁸, Tatsuaki Okada⁸, Munetaka Ueno⁸, Toshifumi Mukai⁸, Makoto Yoshikawa⁸, Junichiro Kawaguchi⁸

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ABSTRACT

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マイクロブログにおける感情・コミュニケーション・動作タイプの推定に基づく顔文字の推薦

江村 優花^{†,††}・関 洋平^{††}

現在、電子メール、チャット、マイクロブログなどのメディアで、顔文字は日常的に使用されている。顔文字は、言語コミュニケーションで表現できない、ユーザーの感情やコミュニケーションの意図を表すのに便利であるが、反面、その種類は膨大であり、場面に合った顔文字を選ぶことは難しい。本研究では、ユーザーの顔文字選択支援を目的として、ユーザーが入力したテキストに現れる感情、コミュニケーション、動作のタイプ推定を行い、顔文字を推薦する方法を提案する。感情、コミュニケーション、動作のタイプは、Twitterから収集したコーパスを用いてカテゴリを定義し、推定システムは、k-NNに基づき実現した。また、システムが推薦する顔文字がユーザーの意図にどの程度適合しているか、5名の被験者により評価した結果、91件のつぶやきに対して66.6%の顔文字が適切に推定されており、感情カテゴリのみを用いて推薦された結果と比べて、提案手法の顔文字推薦の精度が有意に向上していることがわかった。

キーワード：顔文字推薦、感情カテゴリ、コミュニケーションタイプ、動作タイプ、マイクロブログ

Facemark Recommendation based on Emotion, Communication, and Motion Type Estimation in Microblogs

YUKA EMURA^{†,††} and YOHEI SEKI^{†††}

Many users use facemarks everyday in recent computer mediated communication environments such as e-mail, chatting, and Microblogs. Although facemarks are useful to express the emotion or communication intentions beyond natural language communication, many users feel difficult to choose the right one from lots of candidates according to the situation. We propose a method to recommend facemarks based on the estimation of emotions, communication, or motion types in texts written by users. Emotion, communication, or motion types are defined with Twitter corpus, and estimation system is implemented with k-NN. Five assessors evaluated the relevance of recommended facemarks for their intention, and found that 66.6% of facemarks for

論文の実例(2)

江村優花, 関洋平: マイクロブログにおける感情・コミュニケーション・動作タイプの推定に基づく顔文字の推薦. 自然言語処理. Vol.19, No.5, 2012, p.401-418.

https://www.jstage.jst.go.jp/article/jnlp/19/5/19_401/_article/-char/ja/

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論文

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マイクロブログにおける感情・コミュニケーション・動作タイプの推定に基づく顔文字の推薦

江村 優花¹⁾²⁾, 関 洋平³⁾

1) 筑波大学情報学群知識情報・図書館学類 2) 現在、フコク情報システム株式会社 3) 筑波大学図書館情報メディア系

⊕ J-STAGE公開日 20130319

キーワード: 顔文字推薦, 感情カテゴリ, コミュニケーションタイプ, 動作タイプ, マイクロブログ



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ケーションの意図を表すのに便利であるが、反面、その種類は膨大であ
文字を選ぶことは難しい。本研究では、ユーザの顔文字選択支援を目的
力したテキストに現れる感情、コミュニケーション、動作のタイプ推定を行い、顔文字を推
薦する方法を提案する。感情、コミュニケーション、動作のタイプは、Twitterから収集した
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薬袋秀樹: 図書館協議会の可能性—草の根からの図書館振興. 社会教育. No.792, 2012, p.20-25.

ARTICLE

図書館協議会の可能性

—草の根からの図書館振興

筑波大学図書館情報メディア系教授 薬袋秀樹

はじめに

近年、公立図書館における図書館協議会の活動に関するニュースを聞くことが多い。以前と比べて、図書館協議会の活動は活発化していると言われるが、課題も多い。

図書館協議会の設置の現状については、三年ごとに、文部科学省の「社会教育調査」で県別・地方公共団体の種類別に設置図書館数の調査が行われている(註)。

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図書館協議会の現状・可能性・課題について、関係文献と筆者の協議会委員の経験をもとに論じてみたい。

の条例で定めなければならない(一六条)。

一〇一年に、地域の自主性及び自立性を高めるための改革の推進を図るために関係法律の整備に関する法律(平成二三年法律第一〇五号)によって図書館法が改正され、「委員の任命の基準については、文部科学省令で定める基準を参考するものとする」が付け加えられた(一六条)。

併せて、図書館法施行規則(文部科学省令)が改正され、参考すべき基準として、「学校教育及び社会教育の関係者、家庭教育の向上に資する活動を行う者並びに学識経験のある者の中から任命することとする」と定められた(二二条)。

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[Minai, Hideki](#)
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発行日: 6月-2012

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特集

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東京家政大学・同大学院教授 山本和人

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—活動を活性化するために—

常葉学園大学教育学部教授 上條秀元

図書館協議会の可能性

—草の根からの図書館改革

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各種委員を活性化するための提案

社会教育委員

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杉並区立図書館協議会副会長 湿美恵子

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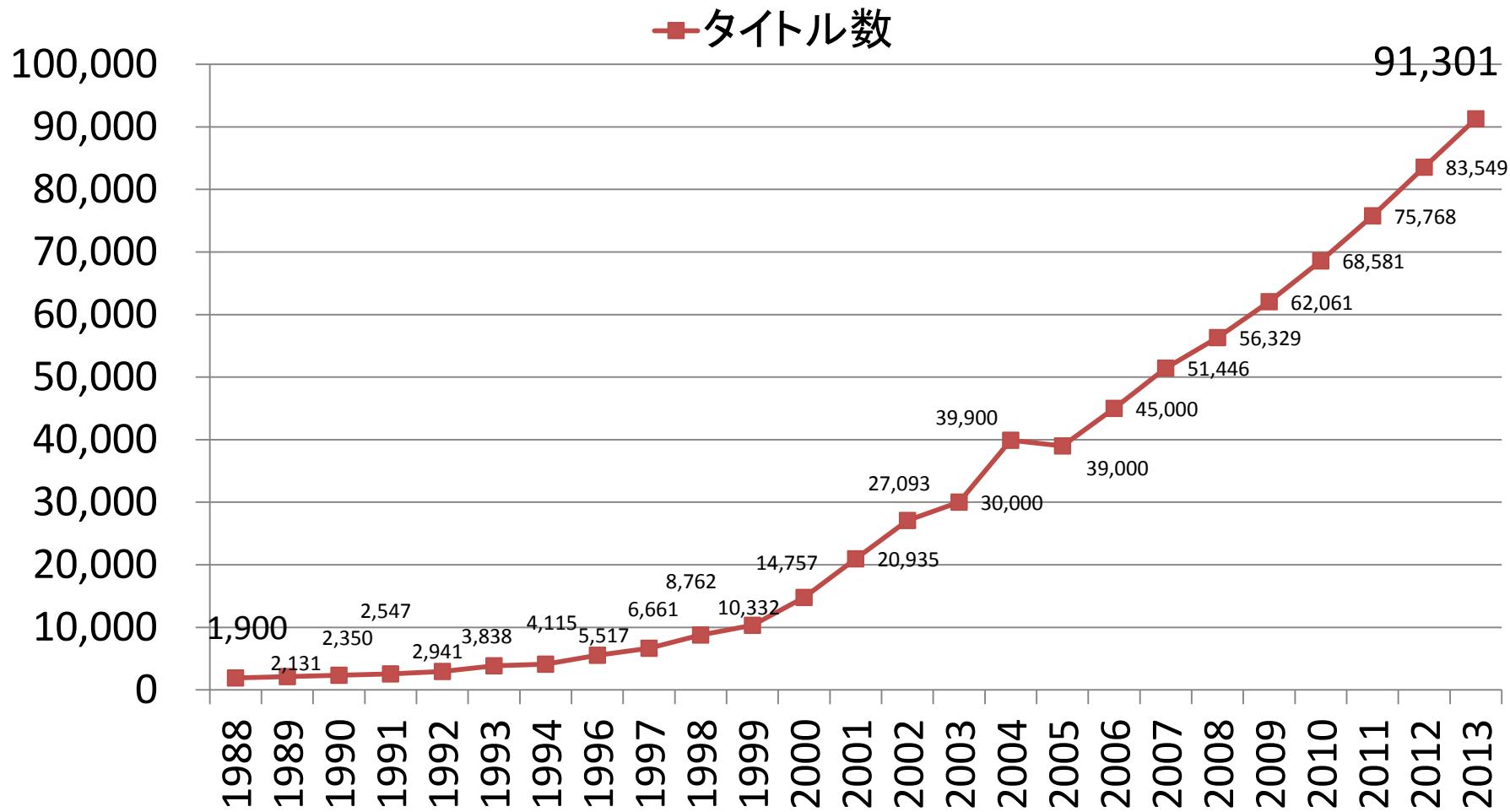
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- 1990年代頃から、電子版提供の試み
- 1990年代半ば～終わり頃、ウェブを通じたオンラインジャーナルの提供開始
 - はじめは紙版の代替(簡易版)
 - PDF
 - 次第に本格版へ
 - E-onlyの登場(オンライン雑誌)
- 多様化・先端化・変容へ
 - XML / HTML+ α による提供
 - Future of article (2011) の登場

電子ジャーナルの規模・変遷



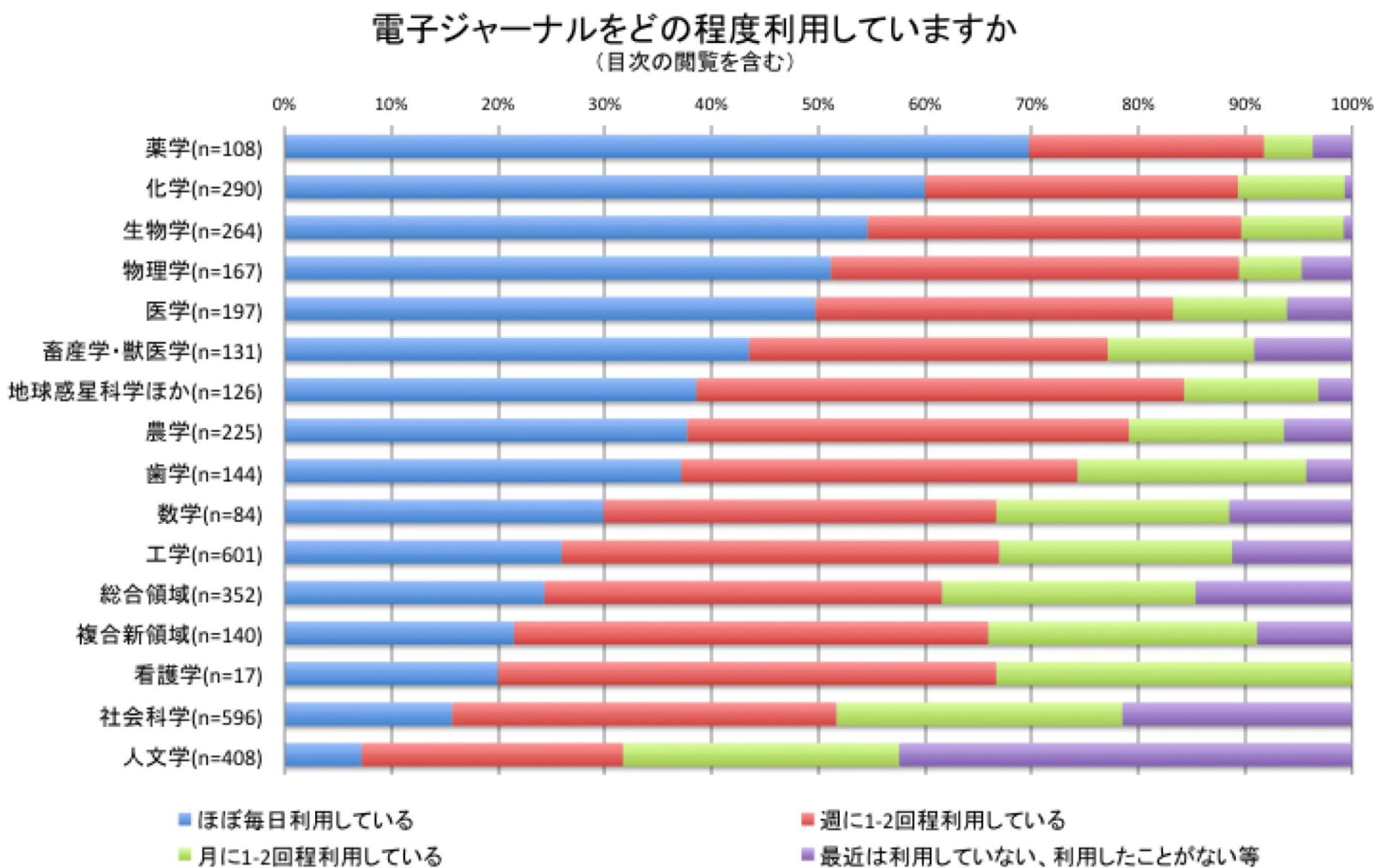
出典: Ulrich's Periodicals Directory.

倉田敬子:「学術情報流通とオープンアクセス」. 勁草書房, 2007, p.117. 図5.2より。

電子ジャーナルの受容

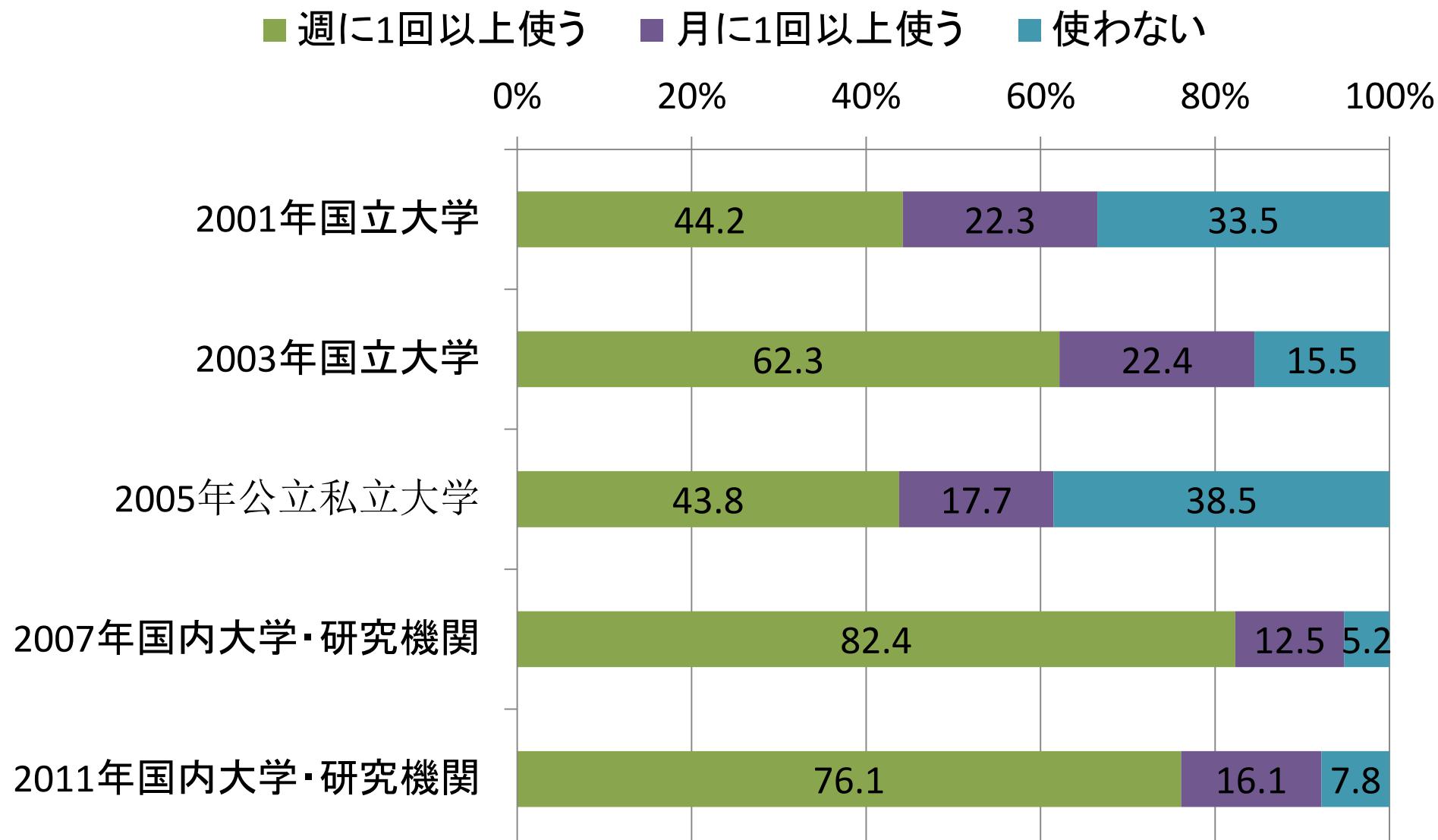
- 1990年代終わりに始まった電子ジャーナルは急速に受け入られた。
- 2011年に国内の大学・研究機関を対象とした学術図書館研究委員会によるアンケート調査(SCREAL調査)によれば
 - 薬学、化学、生物学、物理学、医学の分野では、研究者の半数以上が「ほぼ毎日」電子ジャーナルを使う
 - 人文社会科学系の分野でも、7割以上が「月に1回以上」利用している。
- 週に1回以上電子ジャーナルを利用する研究者の割合は、2001年調査:44%→2011年調査:76%まで増加(自然科学系)

電子ジャーナル利用の浸透度(Q15)



出典: SCREAL調査2011. <http://www.screal.jp/>

電子ジャーナル利用の浸透度(自然科学系)



出典: SCREAL調査2011. <http://www.screal.jp/>

学術分野における文献提供

学術分野における文献提供の環境と利用

- ・「オンラインジャーナル」「Eジャーナル」
- ・ウェブを通じた提供
- ・ウェブブラウザによる閲覧
 - ランディングページ(HTML)
 - = 書誌詳細のページ; メタページ; アイテムページ
 - 本文(論文自体) = Fulltext (全文)
 - PDF
 - HTML
 - etc.

学術分野における文献提供の環境と利用 (2)

- オンラインジャーナルを出版する出版社単位でプラットフォーム(ウェブサイト)を構築
 - 複数の学会や出版社による共用も
 - J-Stage : 科学技術振興機構(JST)
 - 物理系学術誌刊行センター: 日本物理学会, 応用物理学会
 - Scitation : AIP (American Institute of Physics)
 - 投稿、査読、出版システムと連携している場合も

オンラインジャーナル・プラットフォーム

- ・どのようなフォーマットで提供されているか？
- ・プラットフォームは誰が運営しているか？
 - 論文の出版/刊行の主体と異なるか？
- ・どのようなフローで作られているか？
 - 電子化は誰が担当しているか？
- ・どのような機能があるか？

学術分野における文献提供の環境と利用 (2)

- 例1:『Science』American Association for the Advancement of Science (AAAS)
 - ScienceMag.org
- 例2:『Nature』Nature Publishing Group
 - Nature.com
- 例3:『Journal of American Society for Information Science and Technology』American Society for Information Science and Technology (ASIS&T)
 - Wiley.com
- 例4:『Information Processing and Management』Elsevier
 - Sciencedirect.com
- 例5:『Information Retrieval』Springer
 - Springer.com
- 例6:『Computing Survey』ACM
 - ACM.org
- 例7:『情報管理』科学技術振興機構 (JST)
 - Jstage.jst.go.jp
- 例8:『社会教育』全日本社会教育連合会
 - つくばリポジトリ – Tulips-R
- 例9:『図書館情報メディア研究』筑波大学図書館情報メディア研究科
 - つくばリポジトリ – Tulips-R
- 例10:『情報の科学と技術』情報科学技術協会
 - CiNii Articles

例1

Tomoki Nakamura, Takaaki Noguchi, Masahiko Tanaka, et al.: "Itokawa Dust Particles: A Direct Link Between S-Type Asteroids and Ordinary Chondrites". *Science*, Vol.333, No.6046, 2011, p.1113-1116.

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Science 26 August 2011: 1113-1116 DOI: 10.1126/science.1207758

REPORT

Itokawa Dust Particles: A Direct Link Between S-Type Asteroids and Ordinary Chondrites

Tomoki Nakamura^{1,*}, Takaaki Noguchi², Masahiko Tanaka³, Michael E. Zolensky⁴, Makoto Kimura², Akira Tsuchiyama⁵, Aiko Nakato¹, Toshihiro Ogami¹, Hatsuomi Ishida¹, Masayuki Uesugi⁶, Toru Yada⁶, Kei Shirai⁶, Akio Fujimura⁶, Ryuuji Okazaki⁶, Scott A. Sandford⁵, Yukihiro Ishibashi⁶, Masanao Abe⁶, Tatsuaki Okada⁶, Munetaka Ueno⁶, Toshifumi Mukai⁶, Makoto Yoshikawa⁶, Junichiro Kawaguchi⁶

* To whom correspondence should be addressed. E-mail: tomoki@m.tohoku.ac.jp

ABSTRACT

The Hayabusa spacecraft successfully recovered dust particles from the surface of near-Earth asteroid 25143 Itokawa. Synchrotron-radiation x-ray diffraction and transmission and scanning electron microscope analyses indicate that the mineralogy and mineral chemistry of the Itokawa dust particles are identical to those of thermally metamorphosed LL chondrites, consistent with spectroscopic observations made from Earth and by the Hayabusa spacecraft. Our results directly demonstrate that ordinary chondrites, the most abundant meteorites found on Earth, come from S-type asteroids. Mineral chemistry indicates that the majority of regolith surface particles suffered long-term thermal annealing and subsequent impact shock, suggesting that Itokawa is an asteroid made of reassembled pieces of the interior portions of a once larger asteroid.

Related Resources

In Science Magazine | NEWS & ANALYSIS: PLANETARY SCIENCE | Hayabusa Gets to the Bottom of Deceptive Asteroid Cloaking | THIS WEEK IN SCIENCE: Extraterrestrial Dust Collection | Science 26 August 2011: 1081 | THIS WEEK IN SCIENCE: Extraterrestrial Dust Collection | Science 26 August 2011: 1067.

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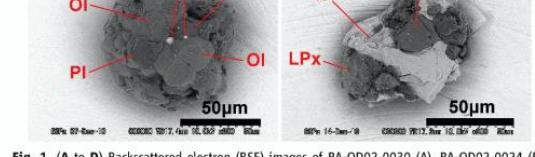


Fig. 1. (A to D) Backscattered electron (BSE) images of RA-QD02-0030 (A), RA-QD02-0024 (B), RA-QD02-0013 (C), and RA-QD02-0027 (D).

REPORTS

grains. The remaining 447 particles are polymimetic mixtures, mainly silicates. Several other particles are silica minerals and K-bearing halite, all of uncertain origin.

Of the 40 particles removed by tapping (diameters ranging from 30 to 180 μm) that were analyzed by x-ray computed microtomography (7) and x-ray diffraction, 38 were subjected to more detailed mineralogic analysis. Backscattered electron images of selected particles are shown in Fig. 1, A to D. RA-QD02-0030 (Fig. 1A) and RA-QD02-0024 (Fig. 1B) have a platy morphology, are polymimetic, and have many mineral grains 1 to 10 μm in diameter adhering to their surfaces. Their appearance is typical of most Itokawa particles. Two particles show different morphologies: RA-QD02-0013 (Fig. 1C) has a smoother soccer-ball shape, whereas RA-QD02-0027 (Fig. 1D) consists of a large troilite crystal and smaller silicates. Particles that contain troilite or taenite as major components like RA-QD02-0027 are rare.

Mineralogical analysis of individual "tapped" particles indicates that they consist mainly of coarse [typically 10 to 50 μm in diameter (7)] crystalline silicates, the most abundant being olivine. The next most abundant minerals are low- and high-Ca pyroxene and plagioclase (fig. S6A). Low-Ca pyroxene is exclusively composed of orthopyroxene, except for RA-QD02-0060, which is dominated by low-Ca clinopyroxene (monoclinic structure was confirmed by x-ray diffraction). The degree of crystallinity of silicates differs between and within particles, particularly for plagioclase. Some particles contain chromite, chlorapatite, merrillite, and troilite up to 25 μm in size. Small inclusions (up to 10 μm) of taenite, kamacite, troilite, and

<http://dx.doi.org/10.1126/science.1207758>

Of the 40 particles removed by tapping (diameters ranging from 30 to 180 μm) that were analyzed by x-ray computed microtomography (7) and x-ray diffraction, 38 were subjected to more detailed mineralogic analysis

Postdoctoral Fellow Positions at UMDI, Japan Medical S

例2

Reka Albert, Hawoong Jeong, Albert-Laszlo Barabasi: “Internet: Diameter of the World-Wide Web”. *Nature*, Vol.401, p.1113-1116.

The screenshot shows the homepage of the Nature journal website. At the top, there's a banner for "We're throwing a PC Party during Phusion Fest". Below the banner, the "nature" logo is displayed with the subtitle "International weekly journal of science". A search bar is present, along with a "subscribe" button and account information. The main content area features a brief communication titled "Internet: Diameter of the World-Wide Web" by Réka Albert, Hawoong Jeong, and Albert-Laszlo Barabasi, published in Nature 401, 130-131 (9 September 1999). The abstract discusses the topology of the web as a large directed graph and its connectivity.

Brief Communications

Nature 401, 130-131 (9 September 1999) | doi:10.1038/43601

Internet: Diameter of the World-Wide Web

Réka Albert¹, Hawoong Jeong¹ & Albert-László Barabási¹

Despite its increasing role in communication, the World-Wide Web remains uncontrolled: any individual or institution can create a website with any number of documents and links. This unregulated growth leads to a huge and complex web, which becomes a large directed graph whose vertices are documents and whose edges are links (URLs) that point from one document to another. The topology of this graph determines the web's connectivity and consequently how effectively we can locate information on it. But its enormous size (estimated to be at least 8×10^8 documents¹) and the continual changing of documents and links make it impossible to catalogue all the vertices and edges.

The extent of the challenge in obtaining a complete topological map of the web is illustrated by the limitations of the commercial search engines: Northern Light, the search engine with the largest coverage, is estimated to index only 38% of the web². Although much work has been done to map and characterize the Internet's infrastructure^{3,4}, little is known about what really matters in the search for information — the topology of the web. Here we take a step towards filling this gap: we have used local connectivity measurements to construct a topological model of the World-Wide Web, which has enabled us to explore and characterize its large-scale properties.

To determine the local connectivity of the web, we constructed a robot that adds to its database all URLs found on a document and recursively follows these to retrieve the related documents and URLs. We used the data collected to determine the probabilities $P_{\text{out}}(k)$ and $P_{\text{in}}(k)$ that a document has k outgoing and incoming links, respectively. We find that both $P_{\text{out}}(k)$ and $P_{\text{in}}(k)$ follow a power law over several orders of magnitude, remarkably different not only from the Poisson distribution predicted by the classical theory of random graphs^{5,6}, but also from the bounded distribution found in models of random networks⁷.

The power-law tail indicates that the probability of finding documents with a large number of links is significant, as the network connectivity is dominated by highly connected web pages. Similarly, for incoming links, the probability of finding very popular addresses, to which a large number of other documents point, is non-negligible, an indication of the flocking nature of the web. Furthermore, while the owner of each web page has complete freedom in choosing the number of links on a document and the addresses to which they point, the overall system obeys scaling laws characteristic only of highly interactive self-organized systems and critical phenomena⁸.

To investigate the connectivity and the large-scale topological properties of the

<http://dx.doi.org/10.1038/43601>

brief communications

- Chase, M. R., Möller, C., Kesseli, R. & Bawa, K. S. *Nature* 383, 398–399 (1996).
- Nason, J. D., Allen, Here, E. & Hamrick, J. L. *Nature* 391, 685–687 (1998).
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- Rand, D. M. *Conserv. Biol.* 10, 665–671 (1996).

Internet

Diameter of the World-Wide Web

Despite its increasing role in communication, the World-Wide Web remains uncontrolled: any individual or institution can create a website with any number of documents and links. This unregulated growth leads to a huge and complex web, which becomes a large directed graph whose vertices are documents and whose edges are links (URLs) that point from one document to another. The topology of this graph determines the web's connectivity and consequently how effectively we can locate information on it. But its enormous size (estimated to be at least 8×10^8 documents¹) and the continual changing of documents and links make it impossible to catalogue all the vertices and edges.

The extent of the challenge in obtaining a complete topological map of the web is illustrated by the limitations of the commercial search engines: Northern Light, the search engine with the largest coverage, is estimated to index only 38% of the web². Although much work has been done to map and characterize the Internet's infrastructure^{3,4}, little is known about what really matters in the search for information — the topology of the web. Here we take a step towards filling this gap: we have used local connectivity measurements to construct a topological model of the World-Wide Web, which has enabled us to explore and characterize its large-scale properties.

To determine the local connectivity of the web, we constructed a robot that adds to its database all URLs found on a document and recursively follows these to retrieve the related documents and URLs. We used the data collected to determine the probabilities $P_{\text{out}}(k)$ and $P_{\text{in}}(k)$ that a document has k outgoing and incoming links, respectively. We find that both $P_{\text{out}}(k)$ and $P_{\text{in}}(k)$ follow a power law over several orders of magnitude, remarkably different not only from the Poisson distribution predicted by the classical theory of random graphs^{5,6}, but also from the bounded distribution found in models of random networks⁷.

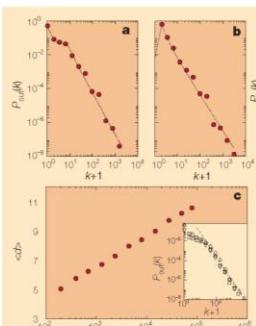


Figure 1 Distribution of links on the World-Wide Web. **a**, Outgoing links (URLs found on an HTML document); **b**, incoming links (URLs pointing to a certain HTML document). Data were obtained from the complete map of the n.edu domain, which contains 325,729 documents and 1,469,680 links. Dotted lines represent analytical fits used as input distributions in constructing the topological model of the web. The tail of the distributions follows $P(k) \propto k^{-\gamma}$, with $\gamma_{\text{out}} = 2.1$ and $\gamma_{\text{in}} = 2.1$. **c**, Average of the shortest path between two documents as a function of system size, as predicted by the model. To check the validity of our predictions, we determined $M(d)$ for documents in the domain n.edu. The measured $\langle d_{\text{web}} \rangle = 11.2$ agrees well with the prediction $\langle d_{\text{web}} \rangle = 11.6$ obtained from our model. To show that the power-law tail of $P(k)$ is a universal feature of the web, the most shows $P_{\text{out}}(k)$ obtained by starting from whitehouse.gov (squares), yahoo.com (triangles) and snu.ac.kr (inverted triangles). The slope of the dashed line is $\gamma_{\text{out}} = 2.45$, as obtained from n.edu in **a**.

incoming links, the probability of finding very popular addresses, to which a large number of other documents point, is non-negligible, an indication of the flocking nature of the web. Furthermore, while the owner of each web page has complete freedom in choosing the number of links on a document and the addresses to which they point, the overall system obeys scaling laws characteristic only of highly interactive self-organized systems and critical phenomena⁸.

To investigate the connectivity and the large-scale topological properties of the web, we constructed a directed random

$k_i + 1$ outgoing (or incoming) links is less than $N P_{\text{out}}(k_i + 1)$ (or $N P_{\text{in}}(k_i + 1)$).

A particularly important quantity in a search process is the shortest path between two documents, d , defined as the smallest number of URL links that must be followed to navigate from one document to the other. We find that the average of d over all pairs of vertices is $\langle d \rangle = 0.35 + 2.06 \log(N)$ (Fig. 1c), indicating that the web forms a small-world network^{5,7}, which characterizes social or biological systems. For $N = 8 \times 10^8$, $\langle d_{\text{web}} \rangle = 18.59$; that is, two randomly chosen documents on the web are on average 19 clicks away from each other.

For a given N , d follows a gaussian distribution so $\langle d \rangle$ can be interpreted as the diameter of the web, a measure of the shortest distance between any two points in the system. Despite its huge size, our results indicate that the web is a highly connected graph with an average diameter of only 19 links. The logarithmic dependence of $\langle d \rangle$ on N is important to the future potential of the web: we find that the expected 1,000% increase in the size of the web over the next few years will change $\langle d \rangle$ very little, from 19 to only 21.

The relatively small value of $\langle d \rangle$ indicates that an intelligent agent, who can interpret the links and follow only the relevant one, can find the desired information quickly by navigating the web. But this is not the case for a robot that locates the information based on matching strings. We find that such a robot, aiming to identify a document at distance $\langle d \rangle$, needs to search $M(\langle d \rangle) \approx 0.53 \times 10^{0.92}$ documents, which, with $N = 8 \times 10^8$, leads to $M = 8 \times 10^7$, or 10% of the whole web. This indicates that robots cannot benefit from the highly connected nature of the web, their only successful strategy being to index as much of the web as possible.

The scale-free nature of the link distributions indicates that collective phenomena play a previously unsuspected role in the development of the web⁸, forcing us to look beyond the traditional random graph models^{5,5,7}. A better understanding of the web's topology, aided by modelling efforts, is crucial in developing search algorithms or designing strategies for making information widely accessible on the World-Wide Web. Fortunately, the surprisingly small diameter of the web means that all that information is just a few clicks away.

Réka Albert, Hawoong Jeong,

Albert-László Barabási

Department of Physics, University of Notre Dame, Notre Dame, Indiana 46556, USA

Figure 1: Distribution of links on the World-Wide Web.

a, Outgoing links (URLs found on an HTML document); b, incoming links (URLs pointing to a certain HTML document). Data were obtained from the complete map of the n.edu domain, which contains 325,729 documents and 1,469,680 links.

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例3

Natsuo Onodera, Mariko Iwasawa, Nobuyuki Midorikawa, et al.: “A method for eliminating articles by homonymous authors from the large number of articles retrieved by author search”. Journal of the American Society for Information Science and Technology, 2011, Vol.62, No.4, p.677-690

The screenshot shows the Wiley Online Library interface. At the top, there's a banner with the text "We made research easy. Now we make job hunting easy." and the Wiley Job Network logo. Below the banner, the Wiley Online Library logo and navigation links for Publications, Browse by Subject, Resources, and About Us are visible. The main content area displays the article details for "A method for eliminating articles by homonymous authors from the large number of articles retrieved by author search". The article is from the "JOURNAL OF THE AMERICAN SOCIETY FOR INFORMATION SCIENCE AND TECHNOLOGY". The authors listed are Natsuo Onodera¹, Mariko Iwasawa¹, Nobuyuki Midorikawa¹, Fuyuki Yoshikane¹, Kou Amano², Yutaka Ootani³, Tadashi Kodama⁴, Yasuhiko Kiyama⁴, Hiroyuki Tsunoda⁵, Shizuka Yamazaki⁵. The article was first published online on 9 FEB 2011, with DOI: 10.1002/asi.21491. The journal is the "Journal of the American Society for Information Science and Technology", Volume 62, Issue 4, pages 677–690, April 2011. The page also includes sections for Abstract, Article, References, and Cited By, along with a "Get PDF (171K)" button.

A Method for Eliminating Articles by Homonymous Authors From the Large Number of Articles Retrieved by Author Search

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This paper proposes a methodology which discriminates the articles by the target authors (“true” articles) from those by other homonymous authors (“false” articles). Author name searches for 2,595 “source” authors in six subject fields retrieved about 629,000 articles. In order to extract true articles from the large amount of the retrieved articles, including many false ones, two filtering stages were applied. At the first stage any retrieved article was eliminated as false if either its affiliation addresses had little similarity to those of its source article or there was no citation relationship between the journal of the retrieved article and that of its source article. At the second stage, a sample of retrieved articles was subjected to manual judgment and utilizing the judgment results, discrimination functions based on logistic regression were defined. These discrimination functions demonstrated both the recall ratio and the precision of about 95% and the accuracy (correct answer ratio) of 90–95%. Existence of common coauthor(s), address similarity, title words similarity, and interjournal citation relationships between the retrieved and source articles were found to be the effective discrimination predictors. Whether or not the source author was from a specific country was also one of the important predictors. Furthermore, it was shown that a retrieved article is almost certainly true if it was cited by, or cocited with, its source article. The method proposed in this study would be effective when dealing with a large number of articles whose subject fields and affiliation addresses vary widely.

Introduction

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<http://dx.doi.org/10.1002/asi.21491>

found from the articles published during the period between 1999 and 2002 in the Web of Science (WoS), and among these names 65% were Asian (54% Japanese). Obviously, many of the author names correspond to different authors. The problem with Western author names is comparatively less critical but nevertheless exists and cannot be ignored. Aksnes (2008) showed that if the 31,135 researchers registered in the Norwegian Research Personnel Register (Ver. 2005) were listed in the ISI style, 4,362 (14%) homonymous authors would be found.

A number of methods exist to discriminate the wanted articles from the unwanted ones by homonymous authors among the articles retrieved through a database search. The best method is to obtain a list of the papers published by the target researcher(s) and compare the

defined. These discrimination functions demonstrated both the recall ratio and the precision of about 95% and the accuracy (correct answer ratio) of 90–95%. Existence of common coauthor(s), address similarity, title words similarity, and interjournal citation relationships between the retrieved and source articles were found to be the effective discrimination predictors. Whether or not the source author was from a specific country was also one of the important predictors. Furthermore, it was shown that a retrieved article is almost certainly true if it was cited by, or cocited with, its source article. The method proposed in this study would be effective when dealing with a large number of articles whose subject fields and affiliation addresses vary widely.

例4

Kisaburo Nakazawa, Hiroshi Nakamura, Taisuke Boku, Ikuo Nakata, Yoshiyuki Yamashita: “CP-PACS: A massively parallel processor at the University of Tsukuba”. *Parallel Computing*, 1999, Vol.25, No.13, p.1635-1666

The screenshot shows the ScienceDirect homepage with a search bar and navigation links. Below it, the article details for "Parallel Computing" are displayed. The title is "CP-PACS: A massively parallel processor at the University of Tsukuba". The authors listed are Kisaburo Nakazawa, Hiroshi Nakamura, Taisuke Boku, Ikuo Nakata, and Yoshiyuki Yamashita. The article was published in Volume 25, Issues 13–14, December 1999, Pages 1635–1661. The abstract, keywords, and references are also visible.



CP-PACS: A massively parallel processor at the University of Tsukuba

Kisaburo Nakazawa^{a,*}, Hiroshi Nakamura^b, Taisuke Boku^c, Ikuo Nakata^d, Yoshiyuki Yamashita^c

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^b Research Center for Advanced Science and Technology, The University of Tokyo, 4-6-1 Komaba, Meguro-ku, Tokyo 153-8904, Japan

^c Institute of Information Sciences and Electronics, University of Tsukuba, 1-1-1 Tennohdai, Tsukuba, Ibaraki 305-8577, Japan

^d University of Library and Information Science, 1-2 Kasuga, Tsukuba, Ibaraki 305-8550, Japan

Received 2 October 1998; received in revised form 16 December 1998

Abstract

Computational Physics by Parallel Array Computer System (CP-PACS) is a massively parallel processor developed and in full operation at the Center for Computational Physics at the University of Tsukuba. It is an MIMD machine with a distributed memory, equipped with 2048 processing units and 128 GB of main memory. The theoretical peak performance of CP-PACS is 614.4 Gflops. CP-PACS achieved 368.2 Gflops with the Linpack benchmark in 1996, which at that time was the fastest Gflops rating in the world.

CP-PACS has two remarkable features. Pseudo Vector Processing feature (PVP-SW) on each node processor, which can perform high speed vector processing on a single chip superscalar microprocessor; and a 3-dimensional Hyper-Crossbar (3-D HXB) Interconnection network, which provides high speed and flexible communication among node processors.

In this article, we present the overview of CP-PACS, the architectural topics, some details of hardware and support software, and several performance results. © 1999 Elsevier Science B.V. All rights reserved.

Keywords: Massively parallel processor; Distributed memory; Processor architecture; Interconnection network; Benchmark

[http://dx.doi.org/10.1016/S0167-8191\(99\)00078-2](http://dx.doi.org/10.1016/S0167-8191(99)00078-2)

* Corresponding author.

例5 Omar Alonso: “Implementing crowdsourcing-based relevance experimentation: an industrial perspective”. Information Retrieval, 2013, Vol.16, No.2p.101-120

The screenshot shows the SpringerLink interface for the article. At the top, there's a search bar and navigation links for 'Home' and 'Contact Us'. Below that, two download options are shown: 'Download PDF (669 KB)' and 'View Article'. The main title 'Information Retrieval' is followed by the issue details 'April 2013, Volume 16, Issue 2, pp 101-120'. The article title 'Implementing crowdsourcing-based relevance experimentation: an industrial perspective' is displayed, along with the author's name 'Omar Alonso'. Below the title, there's a summary abstract, a 'Share' section with social media icons, a 'Within this Article' sidebar with links to 'Introduction', 'Related work', 'Development framework', etc., and an 'Other actions' sidebar with links to 'Export citations', 'Register for Journal Updates', etc. A thumbnail image of the journal cover is also visible.

<http://dx.doi.org/10.1007/s10791-012-9204-1>

Inf Retrieval (2013) 16:101–120
DOI 10.1007/s10791-012-9204-1

CROWD SOURCING

Implementing crowdsourcing-based relevance experimentation: an industrial perspective

Omar Alonso

Received: 16 May 2011 / Accepted: 21 June 2012 / Published online: 20 July 2012
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Abstract Crowdsourcing has emerged as a viable platform for conducting different types of relevance evaluation. The main reason behind this trend is that it makes possible to conduct experiments extremely fast, with good results at a low cost. However, like in any experiment, there are several implementation details that would make an experiment work or fail. To gather useful results, clear instructions, user interface guidelines, content quality, inter-rater agreement metrics, work quality, and worker feedback are important characteristics of a successful crowdsourcing experiment. Furthermore, designing and implementing experiments that require thousands or millions of labels is different than conducting small scale research investigations. In this paper we outline a framework for conducting continuous crowdsourcing experiments, emphasizing aspects that should be of importance for all sorts of tasks. We illustrate the value of characteristics that can impact the overall outcome using examples based on TREC, INEX, and Wikipedia data sets.

Keywords Relevance assessment & evaluation · Crowdsourcing · Experiment design · Methodology

1 Introduction

Crowdsourcing has been used for a wide range of applications, from relevance evaluation (Alonso and Mizzaro 2012), machine learning (Alonso et al. 2009) and natural language processing (Snow et al. 2008), just to mention a few. The cost of running experiments in conjunction with the flexibility of the editorial approach at a larger scale, makes this approach very attractive for quickly testing new ideas. It is also possible to introduce experimentation early in the system development cycle.

Now that crowdsourcing is being adopted by industry and academia, people are noticing that its deployment in practice is not that simple. Tasks have to be designed carefully with

About this Article

Title
Implementing crowdsourcing-based relevance experimentation: an industrial perspective

Topics
» Information Storage and Retrieval
» Document Preparation and Text Processing
» Data Mining and Knowledge Discovery

Authors
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例6 Hitoshi Terai, Hitomi Saito, Yuka Egusa, Masao Takaku, Makiko Miwa, Noriko Kando: “Differences between informational and transactional tasks in information seeking on the web”.

Proceedings of the second international symposium on Information interaction in context, 2008, p.152-159

The screenshot shows the ACM Digital Library interface for the article. At the top, there's a header with the ACM logo, 'DIGITAL LIBRARY', and 'University of Tsukuba'. Below it, the title 'Differences between informational and transactional tasks in information seeking on the web' is displayed, along with the authors' names and their institutions. The main content area shows the article abstract, which discusses the influence of task types on information-seeking behaviors. It mentions that eleven participants performed two different types of web search: an informational task and a transactional task. The abstract highlights that the transactional task involved more web pages visited and shorter reading times compared to the informational task. It also notes the analysis of eye-movement data and scanpaths. The right side of the screen shows the article's metadata, including download statistics (5 downloads in 6 weeks, 68 in 12 months, 442 cumulative), citation count (6), and various sharing options like BibTeX and social media. Below the abstract, there are tabs for 'Abstract', 'Authors', 'References', 'Cited By', 'Index Terms', 'Publication', 'Reviews', 'Comments', and 'Table of Contents'. A 'Feedback' link and a 'Switch to single page view (no tabs)' link are also present.

Differences between informational and transactional Tasks in Information Seeking on the Web

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ABSTRACT

We examine the influence of task types on information-seeking behaviors on the Web by using screen capture logs and eye-movement data. Eleven participants performed two different types of web search, an informational task and a transactional task, and their think aloud protocols and behaviors were recorded. Analyses of the screen capture logs showed that the task type affected the information-seeking behaviors. In the transactional task, participants visited more web pages than for the informational task, and their reading time for each page was shorter than in the informational task. A preliminary analysis of eye-movement data for nine participants revealed characteristics of the scanpaths followed in search result pages as well as the distribution of lookzones for each task.

Categories and Subject Descriptors

H.3.3 [Information Storage and Retrieval]: Information Search and Retrieval

Keywords

information-seeking behavior, task type, eye-movements analysis, user studies, Web search

INTRODUCTION

to seek daily ins as using Google timetables, and

<http://dx.doi.org/10.1145/1414694.1414728>

例7 高久雅生, 谷藤幹子: “材料系研究所における機関リポジトリ NIMS eSciDoc の開発から応用まで: 研究者総覧 SAMURAI と研究ライブラリコレクション”. 情報管理, 2012, Vol.55, No.1, p.29-41

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材料系研究所における機関リポジトリ NIMS eSciDoc の開発から応用まで 研究者総覧 SAMURAI と研究ライブラリコレクション
高久 雅生¹⁾, 谷藤 幹子¹⁾
1) 独立行政法人物質・材料研究機構 企画部門 科学情報室
公開日 2012/04/01
キーワード: 機関リポジトリ, 研究者総覧, eSciDoc, SAMURAI, 研究ワークフロー

全文HTML 本文PDF [3368K]

抄録 引用文献(35) 被引用文献(2)

物質・材料研究機構 (NIMS) では、2008年よりデジタルライブラリー構想に基づく機関リポジトリ NIMS eSciDoc の開発と運用を始めた。eSciDocは柔軟な拡張可能性と豊富な Web API を併せ持つドイツ製のオープンソースのリポジトリソフトウェアであり、単に文献リポジトリにとどまらず、eサイエンスのための汎用ツールとしての機能を持ち合わせている。このような利点を活かして開発、運用してきた機関リポジトリ NIMS eSciDoc の現状と課題を報告する。あわせて、機関リポジトリと対をなして取り組んでいる研究者総覧 SAMURAI についても報告する。SAMURAI は、NIMS 研究者約 500 人を対象に、その連絡先や業績文献、研究内容などをわかりやすく伝えるサービスとして、機関リポジトリや外部データベースと密に連携しながら、2010 年より運用を開始した。本報告では、これらのサービス内容と利用動向とともに、今後の展開について述べる。

記事言語: Japanese 前の記事 | 次の記事

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Researchers directory service "SAMURAI" and Research Collection Library
高久 雅生¹⁾ | 谷藤 幹子¹⁾
TAKAKU Masao¹⁾; TANIFUJI Mikiko¹⁾
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1 Scientific Information Office, Planning Division, National Institute for Materials Science
(1-2-1 Sengen Tsukuba-shi, Ibaraki 305-0047)
原稿受理 (2012-02-13)
情報管理 55(1), 029-041, doi:10.1241/johokanri.55.29 (<http://dx.doi.org/10.1241/johokanri.55.29>)
著者抄録
物質・材料研究機構 (NIMS) では、2008 年よりデジタルライブラリー構想に基づく機関リポジトリ NIMS eSciDoc の開発と運用を始めた。eSciDoc は柔軟な拡張可能性と豊富な Web API を併せ持つドイツ製のオープンソースのリポジトリソフトウェアであり、単に文献リポジトリにとどまらず、e サイエンスのための汎用ツールとしての機能を持ち合わせている。このような利点を活かして開発、運用してきた機関リポジトリ NIMS eSciDoc の現状と課題を報告する。あわせて、機関リポジトリと対をなして取り組んでいる研究者総覧 SAMURAI についても報告する。SAMURAI は、NIMS 研究者約 500 人を対象に、その連絡先や業績文献、研究内容などをわかりやすく伝えるサービスとして、機関リポジトリや外部データベースと密に連携しながら、2010 年より運用を開始した。本報告では、これらのサービス内容と利用動向とともに、今後の展開について述べる。
キーワード
機関リポジトリ, 研究者総覧, eSciDoc, SAMURAI, 研究ワークフロー
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情報管理 vol.55 no.1 2012 29

例8

薬袋秀樹: “図書館協議会の可能性—草の根からの図書館振興”. 社会教育. 2012, No.792, p.20-25



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詳細検索
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コミュニティ & コレクション
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つくばリポジトリ (Tulips-R) >
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著者: 薬袋 秀樹
Minai, Hideki
ミナイ, ヒデキ

発行日: 6月-2012

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ARTICLE

図書館協議会の可能性

筑波大学図書館情報メディア系教授 薬袋秀樹

はじめに

近年、公立図書館における図書館協議会の活動に関するニュースを聞くことが多い。以前と比べて、図書館協議会の活動は活発化していると言われるが、課題も多い。

図書館協議会の設置の現状については、三年ごとに、文部科学省の「社会教育調査」で県別、地方公共団体の種類別に設置図書館数の調査が行われている。

全国の図書館協議会の詳しい実績については、一九八五年に日本図書館協会(現、二〇一二年に平山陽菜・池内淳(筑波大学図書館情報メディア系)が調査を行っている)、公立図書館の特定事項に関する調査で取り上げられる場合もある。

図書館協議会の現状 可能性 課題について、関係文献と筆者の協議会委員の経験をもとに論じてみたい。

の条例で定めなければならない（一六条）。

（二）現行図書館法（二〇一一年改正）

図書館協議会については、図書館法第一四一―六条で定められている。

その任務は、「図書館の運営に関する意見

諮詢に応するとともに、図書館の行う

図書館奉仕につき、館長に対して意見

を述べることである（一四条）。

図書館法制定時の解説書では、「住民

の具体的な図書館に対する要望なり意

見なりを、図書館奉仕を実施する責任者

とも言うべき館長に対しても反対せしめ

るために置かれる」と書かれている（註）。

図書館協議会の設置は任意で（一四

条）協議会の委員は、当該図書館を設

置する地方公共団体の教育委員会が任

命する（一五条）。協議会の設置、委員の

定数、任期等必要な事項は地方公共団体

が改定され、図書館法施行規則（文部科学

省令）が改正され、参照すべき基準とし

て、「学校教育及び社会教育の関係者、家

庭教育の向上に資する活動を行う者並

びに学識経験のある者の中から任命す

ることとする」と定められた（一一条）。

（二）図書館法の改正（つづいて）

二〇〇八年の図書館

が改正された（二二条）。

第三

例9 柳玄姫, 葉袋秀樹: “韓国の図書館法と社会的背景”. 図書館情報メディア研究, 2013, Vol.10, No.2, p.1-17.

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その他のタイトル: 〈Papers〉The Korean Library Laws and their social background
著者: 柳, 玄姫
葉袋, 秀樹
[Ryu, Hyeonsook](#)
[Minai, Hideki](#)
リュウ, ヒョンスク
ミナイ, ヒデキ
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図書館情報メディア研究第10巻2号1~17ページ

2012年

韓国の図書館法と社会的背景

柳 玄姫*, 葉袋 秀樹**

The Korean Library Laws and their social background

Hyeonsook RYU, Hideki MINAI

抄録

韓国では、1963年に図書館法が制定され、1987年に改正されたが、1991年に廃止されて、代わりに図書館振興法が、1994年には図書館・読書振興法が制定され、2006年には、再び図書館法が制定された。1987年の改正図書館法を含めて、5つの法律が存在してきたが、これらの基本的内容が未遂するものであることをから、これらの法律を5つの図書館法ととらえることができる。本研究の目的は、それらがどのような社会的背景のもとで、制定・改正されてきたのかを考察することである。

本研究では、まず、韓国の図書館法の制定や改正の社会的背景について、政治・経済、教育・文化の4つの面から考察した。次に、法律の改正や制定の変遷の内容と特徴を考察し、法律の時代区分を試み、3期に分け、各期の法律の特徴を分析した。そして、図書館法の変遷と社会背景の関係について考察した。

その結果、韓国の図書館法は、政治の民主化、経済の発達、公教育の普及、文化政策の確立などを背景として制定・改正されてきたことが明らかになった。

Abstract

In Korea, the Library Law was adopted in 1963. It has been amended in 1987, but was abolished in 1991. Instead, Library Promotion Law has been enacted as Library and Reading Promotion Law in 1994. In 2006, Library Law has again been adopted. Including the Amended Library Law of 1987, a total of 5 laws have existed. Owing to the mutual contents of these, it is possible to treat them as 5 different Library Laws. The object of this paper is to examine the social background, bringing about their enactments and amendments.

Firstly, this paper examines the social background of Korean Library Laws adoption and amendments from four perspectives: political, economic, educational and cultural. Secondly, it considers the contents and characteristics of amendments and enactment changes. Furthermore, this paper attempts a periodization of the 5 laws, dividing them into 3 terms and analysing their characteristics in every period. Then, the paper examines the relationship between the social background and the changes of the Library Laws.

The main conclusions drawn from this paper argue that democratisation of politics, economic development, prevalence of public education and the policy on culture constitute the background for the adoption and amendments of Korean Library Laws.

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Faculty of Library, Information and Media Science, University of Tsukuba

例10 大向一輝: “CiNii Articlesのシステムデザインとデータモデル”. 情報の科学と技術, 2012, Vol.62, No.11, p.473-477.

CiNii 日本の論文をさがす 大学図書館の本をさがす 新規登録 ログイン English

論文検索 著者検索 全文検索 (beta) 大学図書館の本をさがす >

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著者名
ISSN
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卷
参考文献

刊行物名
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検索

CiNii Articlesのシステムデザインとデータモデル(<特集>データベース構築の今)
System design and data modeling of CiNii articles(<Special feature>Database design and construction)

太向一輝

OHMUKAI Iki

国立情報学研究所
National Institute of
Informatics

この論文を読む／探す

 CiNii PDF | CiNii 論文PDF - 定額アクセス可能
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抄録

学術情報サービスにおいて、コスト面での制約がある中で大量のアクセスを高速に処理するためには、サービスが備えるべき機能を精査し、その機能の実現に適したシステム設計を行う必要があるCiNii Articlesでは月間3500万～5000万のアクセスに対応するために、機能要件を検索と書誌表示に限定し、高速な検索エンジンと単純な処理のみを行うRDBを組み合わせることで性能要件を達成した。また、書誌IDを維持・管理するシステムを構築することで信頼性の高い情報サービスの提供を行っている。

In order to process large amount of access at low cost, it is necessary to design the system considering important functions to be provided. In CiNii Articles, we have achieved the performance requirements by using search engine and simple DBMS. We also provide reliable information service by the bibliographic ID management system.

収録刊行物

情報の科学と技術 [巻号一覧]
情報の科学と技術 62(11), 473-477, 2012-11-01 [[この号の目次](#)]
社団法人情報科学技術協会

Information Science and Technology Association

特集：データベース構築の今

CiNii Articles のシステムデザインとデータモデル

大向 一輝*

学術情報サービスにおいて、コスト面での制約がある中で大量のアクセスを高速に処理するためには、サービスが備えるべき機能を精査し、その機能の実現に適したシステム設計を行う必要がある。CiNii Articles では月間3500万～5000万のアクセスに対応するため、機能要件を検索と書誌表示に限定し、高速な検索エンジンと単純な処理のみを行うRDBを組み合わせることで性能要件を達成した。また、書誌IDを維持・管理するシステムを構築することで信頼性の高い情報サービスの提供を行っている。

キーワード：システムデザイン、検索エンジン、データベース管理システム、ユニーク ID、名寄せ

1.はじめに

人々の情報収集の手段として、ウェブは極めて重要な存在となった。学術情報流通の分野においても、ウェブを通じた情報提供サービスの比重が高まっており、研究者や学生にとってなくてはならないインフラとして認識されつつある。実際、サービスへのアクセス数や論文ファイルのダウンロード数は毎年最高値を記録しており、その勢いが衰える気配はない。その意味で、サービス提供者の責任は日増しに大きくなっている。一方、国内では学術情報サービスは公的機関が多く役割を担っているが、昨今の財政状況の中では、需要が伸びていると言えども、それに応じた予算を投入することが難しくなっている。

このように、限られた資源の中で、増え続けるアクセスにどう対応していくかはサービス提供者が抱える共通の課題である。この課題に応えるためには、サービスの要件を明確にするだけでなく、各種のソフトウェアあるいはハードウェアの特徴や制約を知り、それらを生かしたシステムを設計しなければならない。とくに、学術情報サービスは大規模なデータを取り扱うことから、そのデータの構造や管理手法について熟知しておく必要がある。

本稿では、筆者らが開発・運用を行っている学術情報サービスである「CiNii（サイニイ）」を取り上げ、その設計方針と実装について述べる。2012年9月の時点では、CiNiiのサービスには国内の論文情報を提供する「CiNii Articles」と、大学図書館の図書・雑誌の情報を提供する「CiNii Books」という2種類のシステムが併存している。本稿では主にCiNii Articlesについて述べる。なお、CiNii BooksについてもCiNii Articlesと同様の設計方針を踏襲している。

2.データベースとしてのCiNii Articles

2.1 CiNii Articlesの概要

CiNii Articlesは国立情報学研究所（NII）が2005年から運営している国内最大規模の学術論文検索・提供サービスである。学術会や大学との連携によってNIIが電子化を行った約400万件の論文情報を加え、国立国会図書館の雑誌記事索引、科学技術振興機構のJ-Stage、各大学・研究機関が運営する機関リポジトリなどの論文情報を合わせて約1,500万件の論文・記事が検索対象となっている。NIIが電子化した論文はCiNii Articles上で本文ファイルを提供し、外部のサービスに存在している論文についてはリンクを表示する。また、NIIが構築している引用文献索引データベースの情報を用いて、論文の引用・被引用関係を表示することができる。

2.2 機能要件

ユーザー側から見たCiNii Articlesの主な機能としては、入力されたキーワードに合致する論文の一覧を表示する検索機能と、個々の論文の書誌を表示する書誌表示機能、本文ファイルの提供機能、刊行物・巻・号ごとに論文の一覧を表示するディレクトリ機能などがある。いずれの機能も、ユーザーの操作によってシステム内のデータが書き換えられることはなく、ユーザーはもっぱら情報を受け取るのみである。一方、CiNii Articlesで扱うデータは、後述のパックエンドシステムで作成され、毎週1回の頻度でパッチ処理によって更新が行われる。

このように、ユーザーに対しては表示のみを行い、パッチ処理によってデータを更新するという構成は情報システムとして特段珍しいものではない。また、論文の書誌データはあらかじめ構造化されているため、リレーションナルデータベース（RDB）になじみやすい。単純化すれば、論文情報を提供するサービスは、書誌データをRDBに一括登録し、検索や書誌表示といった要求に応じて問い合わせを行い、その結果を表示するようなシステムであればよい。その意味ではCiNii Articlesは典型的なデータベースシステム

	雑誌名	出版社 (編集)	プラット フォーム	提供フォー マット	電子化 の主体	機 能
例1	Science	AAAS	AAAS	PDF, HTML, +α	出版社	◎
例2	Nature	Nature	Nature	PDF, HTML, +α	出版社	◎
例3	JASIS&T	ASIS&T	Wiley	PDF, HTML, +α	Wiley	◎
例4	IPM	Elsevier	Elsevier	PDF, HTML, +α	出版社	◎
例5	IR	Springer	Springer	PDF, HTML, +α	出版社	◎
例6	IiX	ACM	ACM	PDF, HTML, +α	出版社	◎
例7	情報管理	JST	J-STAGE	PDF, HTML, +α	JST	◎
例8	社会教育	全日本社 会教育連 合会	つくばリ ポジトリ	PDF(スキャン)	つくばリ ポジトリ	△
例9	図書館情報 メディア研究	筑波大 学	つくばリ ポジトリ	PDF(スキャン)	つくばリ ポジトリ	△
例10	情報の科 学と技術	情報科学 技術協会	CiNii	PDF(スキャン)	CiNii	△

論文の要素と構造

論文の要素、構造

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 - 著者
 - 抄録(要旨)
 - キーワード
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- 図
- 表
- 参考文献(リスト)

REPORTS

Itokawa Dust Particles: A Direct Link Between S-Type Asteroids and Ordinary Chondrites

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The Hayabusa spacecraft successfully recovered dust particles from the surface of near-Earth asteroid 25143 Itokawa. Synchrotron-radiation x-ray diffraction and transmission and scanning electron microscope analyses indicate that the mineralogy and mineral chemistry of the Itokawa dust particles are identical to those of thermally metamorphosed LL chondrites, consistent with spectroscopic observations made from Earth by the Hayabusa spacecraft. Our results directly demonstrate that ordinary chondrites, the most abundant meteorites found on Earth, come from S-type asteroids. Mineral chemistry indicates that the majority of regolith surface particles suffered long-term thermal annealing and subsequent impact shock, suggesting that Itokawa is an asteroid made of reassembled pieces of the interior portions of a once larger asteroid.

The Hayabusa spacecraft arrived at S(IV) type asteroid 25143 Itokawa (formerly 1998 SF36) in September 2005 (*1*). Remote-sensing measurements from the spacecraft suggest that Itokawa consists of rocks similar to LL5 and LL6 ordinary chondrites (*2, 3*), confirming ground-based spectral characterization (*4*). On 20 and 26 November 2005, the spacecraft descended to touchdown and capture dust particles from MUSES-C Regio. This area consists of dust and gravel deposits dominated by grains up to 1 cm in diameter (*5*). Although the sampler did not operate as planned, an elastic sampling horn impacted onto the asteroid surface, directing dust particles into the spacecraft's sample catcher device (*6*). The Hayabusa sample capsule successfully landed in the Woomera Prohibited Area in South Australia on 13 June 2010. Dust particles collected in the second touchdown were recovered by two methods. In one method, we used a Teflon spatula to sweep particles from about 10% of the surface of a sample catcher. In the other method, we gently tapped on the exterior of the sample catcher, causing particles to drop onto a pure silica glass slide (*6*).

On the Teflon spatula, we identified 1534 rocky particles by means of a field-emission scanning electron microscope. The particles have diameters ranging from 3 to 40 μm but are mostly smaller than 10 μm (*7*). Most Itokawa particles are angular and are probably broken pieces of larger rocks. Among the 1534 harvested rocky particles, 1087 are monomineralic, including 580 olivine particles, 126 low-Ca pyroxenes, 56 high-Ca pyroxenes, 186 feldspars (172 plagioclase and 14 K-feldspar), 113 troilites, 13 chromites, 10 Ca phosphates, and 3 Fe-Ni metal inclusions. The remaining 447 particles are poly-mineralic mixtures, mainly silicates. Several other particles are silica minerals and K-bearing halite, all of uncertain origin.

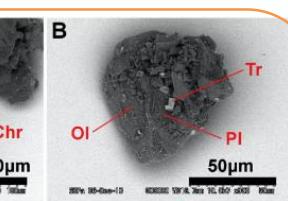
Of the 40 particles removed by tapping (diameters ranging from 30 to 180 μm) that were analyzed by x-ray computed microtomography (*7*) and x-ray diffraction, 38 were subjected to more detailed mineralogic analysis. Backscattered electron images of selected particles are shown in Fig. 1, A to D. RA-QD02-0030 (Fig. 1A) and RA-QD02-0024 (Fig. 1B) have a platy morphology, are polymimetic, and have many mineral grains 1 to 10 μm in diameter adhering to their surfaces. Their appearance is typical of most Itokawa particles. Two particles show different morphologies. RA-QD02-0013 (Fig. 1C) has a smoother soccer-ball shape, whereas RA-QD02-0027 (Fig. 1D) consists of a large troilite crystal and smaller silicates. Particles that contain troilite or taenite as major components like RA-QD02-0027 are rare.

Mineralogical analysis of individual "tapped" particles indicates that they consist mainly of coarse [typically 10 to 50 μm in diameter (*7*)] crystalline silicates, the most abundant being olivine. The next most abundant minerals are low- and high-Ca pynroxene and plagioclase (fig. S6A). Low-Ca pyroxene is exclusively composed of orthopyroxene, except for RA-QD02-0060, which is dominated by low-Ca clinopyroxene (monoclinic structure was confirmed by x-ray diffraction). The degree of crystallinity of silicates differs between and within particles, particularly for plagioclase. Some particles contain chromite, clorapatite, merrillite, and troilite up to 25 μm in size. Small inclusions (up to 10 μm) of taenite, kamacite, troilite, and



A

OI
LPx
Chr
50 μm



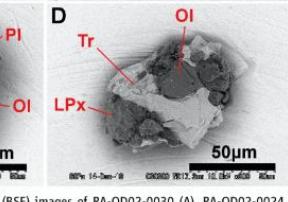
B

OI
Tr
PI
50 μm



C

Tae
OI
PI
50 μm



D

Tr
LPx
OI
50 μm

Fig. 1. (A to D) Backscattered electron (BSE) images of RA-QD02-0030 (A), RA-QD02-0024 (B), RA-QD02-0013 (C), and RA-QD02-0027 (D).

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論文の要素、構造(図表)

Of the 40 particles removed by tapping (diameters ranging from 30 to 180 μm) that were analyzed by x-ray computed microtomography (7) and x-ray diffraction, 38 were subjected to more detailed mineralogic analysis. Backscattered electron images of selected particles are shown in Fig. 1, A to D. RA-QD02-0030 (Fig. 1A) and RA-QD02-0024 have a platy morphology, are polynocrystalline and have many mineral grains 1 to 10 μm in diameter adhering to their surfaces. This is typical of most Itokawa particles. Particles show different morphologies. RA-QD02-0013 (Fig. 1C) has a smoother spherulitic surface, whereas RA-QD02-0027 (Fig. 1D) has a large troilite crystal and smaller silicate spherules that contain troilite or taenite and other components like RA-QD02-0027 are rare.

- 図表 ⇄ 本文のリンク
- 図表番号
- キャプション

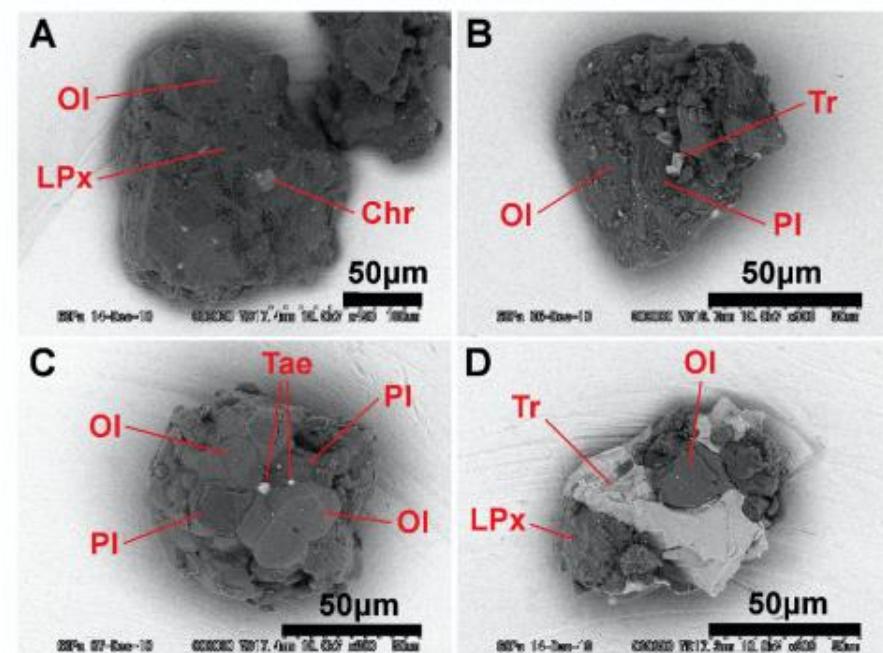


Fig. 1. (A to D) Backscattered electron (BSE) images of RA-QD02-0030 (A), RA-QD02-0024 (B), RA-QD02-0013 (C), and RA-QD02-0027 (D).

論文の要素、構造(文献参照)

The Hayabusa spacecraft arrived at S(IV)-type asteroid 25143 Itokawa (formerly 1998 SF36) in September 2005 (1). Remote-sensing measurements from the spacecraft suggest that Itokawa consists of rocks similar to LL5 and LL6 ordinary chondrites (2, 3), confirming ground-based spectral characterization (4). On 20 and 26 November 2005, the spacecraft descended to touchdown and collected particles from MUSES-C Regio, a field of dust and gravel deposits containing pebbles up to 1 cm in diameter (5).

- 表
- 参考文献(リスト)

REPORTS

greatly between particles (fig. S7), which is typical of moderately shocked astromaterial corresponding shock stages up to S4 (6, 26).

MUSES-C Regio probably formed by segregation and accumulation of fine gravel into areas close to the gravitational center of Itokawa due to global-scale electrostatic grain levitation, vibration-induced granular migration, and deposition of slow moving ejecta launched from surface impacts (27–29). Therefore, particles in MUSES-C Regio originally derived from diverse regions of Itokawa. Fortunately, despite the small mass of the recovered Itokawa samples, they record the critical steps in the history of this asteroid. Itokawa was classified as an S-type asteroid from terrestrial remote sensing, and it has been commonly suggested that S-type asteroids, the most abundant asteroids in the inner asteroid belt, are the parent bodies of ordinary chondrites. Our petrologic data from MUSES-C Regio confirm that Itokawa is indeed an ordinary chondrite (LL4 to LL6), thereby finally linking these asteroids and meteorites.

References and Notes

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Supporting Online Material

- www.sciencemag.org/cgi/content/full/333/6046/1113/DC1
Figs. S1 to S8
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2 May 2011; accepted 2 August 2011
10.1126/science.1207758

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(Supplementary material)
 - 図表
 - ビデオ
 - 音声
 - ...
- デジタルドキュメントならではの要素が多く出てくる
- Science誌での例から:
<http://dx.doi.org/10.1126/science.1207758>

学術分野のデジタルドキュメントの 閲覧配信フォーマット

- PDF
- PostScript (PS)
- LaTeX
- HTML
- (XML)
- (ビデオ)

オンラインジャーナルの動向

- オンラインのみの雑誌(E-only)
 - 例1: Dlib Magazine(<http://www.dlib.org/>)
 - 1995年創刊
 - 例2: PLoS One(<http://www.plosone.org/>)
 - 2006年創刊
- 紙メディアからの離脱
 - △ Issue
 - △ Volume
 - ? ページ
 - ○ Article number

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 - PLOS ONEによるメガジャーナル実証
- ウェブプラットフォームの開発競争へ
- 論文以外を対象とする新しい種別のジャーナル
 - ビデオジャーナル (Method / Protocol)
 - [Journal of Visualized Experiments \(JoVE\)](#)
 - データジャーナル (Database / Metadata)
 - [Scientific Data](#) by Nature Publishing Group



Exposed proteins of the *Schistosoma japonicum* tegument

Jason Mulvenna^{1,2}*, Luke Moerdyk³, Malcolm K. Jones^{4,5}, Supavee Nawaratna⁶, Erica M. Lovis¹, Geoffrey N. Cobert⁶, Michelle Colgrave⁶, Alan Jones⁷, Alex Loukas⁸, Donald P. McManus⁹

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⁷ These authors contributed equally to the manuscript.

Research highlights

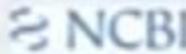
- Proteins exposed on the surface of parasitic worms are an important source of novel drug and vaccine targets.
- These proteins are the most accessible to the host and likely to possess functions important for the survival of the worm.
- Biotinylation (labelling of lysine side-chain residues with biotin) of whole worms is a useful technique for separating exposed proteins from other protein constituents of the tegument.
- Using this technique in combination with LC-MS/MS we identified 54 proteins as putatively host-exposed in *Schistosoma japonicum*.
- Using confocal and electron microscopy, the immunolocalisation of these proteins was observed.

Sidebar content

... proteins

5 of 54 (100%)

All 54 (100%)



elongation factor 1- α [*Schistosoma japonicum*]

348 aa protein

Connexin-annexin-like⁺ (NCBI)



1msd

Download movie

Subcellular Location

Cytosol/Nucleus

Accessions

AAK57918

Version:

AAK57918.1 (214258828)

...

<http://www.articleofthefuture.com/>



Protein Identification v. Subcellular location

• Found

Schistosoma japonicum⁺; Eukaryota; Metazoa; Polychaomorpha; Trematoda; Digeneta; Strigidae; Schistosomatidae; Schistosomatidae; Schistosoma; Similar proteins (1) (PDB.org)

オープンサイエンス(Open Science)

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 - オープンデータ
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- ウェブ上でのコメント、査読機能
- (査読とはどうあるべきか？)
- (科学的であるとはどういうものか？)

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 - 電子ジャーナルコンテンツの作成、利用の実際
 - オープンアクセスとその先まで
- Further readings (参考文献)
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<http://current.ndl.go.jp/ca1720>

次回は11月6日(水)