

## *Challenges and Opportunities for Chinese Library to Face SCOAP3 Development*

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### **Abstract**

The SCOAP3 funding model is entirely open to “core” journals in the HEP content. This article describes the development, funding model and operational mechanism of SCOAP3. It points that SCOAP3 funding model is more effective and more economical to protect the access to knowledge. In addition, it puts forward higher demands for improving Chinese academic atmosphere. In addition this model provides a new space and chance for Chinese libraries to expand their information services and improve their positions.

**Keywords** SCOAP3; OA; journal publishing; library;

## INTRODUCTION

Open Access (OA), the concept of publishing model which has been proposed since 2001 caused a wide response throughout the world<sup>1</sup>. OA is referred to that the scientific research information is available to the public for free Access with no charge in the network environment. Usually open access can be achieved by the following two modes: one is the open publication model, under which the journals or conference papers are immediately opened to public once these papers are published; another is the open storage model, under which the published papers are firstly stored in a relevant storage and then the storage is opened to public after a required time (according to the publishers). At that time when a number of OA models were rising and developing, the European centre for nuclear research (CERN) also proposed a project which is called "Sponsoring Consortium for Open Access Publishing in Particle Physics" (SCOAP3). As a new OA publishing model for the academic journals, SCOAP3 attempts to transform the traditional subscription fees to direct supports for granting unrestricted access to journals, so as to realize OA for all high quality journals in particle physics field<sup>2</sup>.

## THE ORIGATION OF SCOAP3 PLAN

In High-energy physics (HEP) research area, scientists have started to communicate their research achievements with preprinting model from 1950s by letters to 1990s by electric preprint archives. In this period scientists could voluntarily report their articles which had been completed but not yet published with preprinting model. Compared to journal publishing and web publishing, preprinting has distinct advantages in fast communication and conducive to academy. Today, 90% of the papers published in HEP can be found in the preprint archive. In addition, library's journals purchasing cost increases year by year, (proceeding from the national academy of sciences of U.S. shows that under the condition of the average inflation rate of 3.1%, periodical ordering price grew by an average of 9.5% over the past nearly 20 years) (WenhuiDailyNov. 12th, 2010). Library traditional ordering model has been queried by more and more. But on the other hand, the papers appeared in the preprint archive usually don't have any referee reviews, so it is difficult to guarantee the quality of the articles from preprint archives. Considering this, researchers still need to publish high quality academic articles on journals under the system of strict peer review. In addition, business organizations participate in academic journal publications, which constantly pursue profit maximization, resulting in monopolizing knowledge by the market behavior. This also heavily constrains the free spread of academy, and makes unaffordable for the research institutions to continuously perform long-term subscription of journals. As an example, a Nobel Prize Laureate from the Johns Hopkins university had published an article in *Nature* Journal. When he wanted to cite part of this article in a colloquium, he was told: you had to carry out a "process" in order to get the *Nature*'s permission. "My own research results, how suddenly become someone else's personal belongings?" This Nobel Prize Laureate suddenly filled with doubt and anger (WenhuiDailyNov. 12th, 2010). The current existing scientific communication is just one model, but not the only one. Besides, the whole world of science is undergoing a big change, and it is becoming more public

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1 <http://www.soros.org/openaccess/read.shtml>

2 <http://scoap3.org/about.html>

3 WenhuiDailyNov. 12th, 2010

4 <http://scoap3.org/about.html>

5 WenhuiDailyNov. 12th, 2010

6 Anne Gentil-Beccot, "2005, the Year CERN Ran for Open Access", High Energy Physics Libraries Webzine, issue 12, February 2006

7 <http://press-old.web.cern.ch/pressold/PressReleases/Releases2006/PR16.06E.html>

8 <http://scoap3.org/news.html>

9 <http://scoap3.org/news/news72.html>

10 Newsletter of Library and Information Service

11 <http://scoap3.org/news/news77.html>

12 <http://scoap3.org/news/news79.html>

13 <http://scoap3.org/news/news81.html>

14 <http://scoap3.org/news/news81.html>

and accessible for the general public. Thus the excessive commercialization will directly affect knowledge share and innovation.

In order to guarantee more high quality academic articles in the HEP field to have wide and free exchanges, in December 2005 CERN sets up a workgroup to prepare constructing OA publishing model for HEP. This workgroup representatives and balances the benefits and requirements from the publishers, funding agencies and research institutions, and aims to "study and develop sustainable business modes of OA for current existing and new journals and publishers in particle physics, focused mainly on a sponsoring mode" (Anne Gentil-Beccot).

### **THE IMPLEMENTATION AND NEWEST PROGRESS OF SCOAP3**

In July 2006 several European funding agencies such as CERN, Centre national de la recherche scientifique (CNRS), Deutsches Elektronen Synchrotron (DESY), Max-Planck-Gesellschaft (MPG), Istituto Nazionale di Fisica Nucleare (INFN) proposed capital consortium SCOAP3 to fund all high quality particle physics journal in OA publishing mode. The SCOAP3 model provides a hub of peer-review cost for publishers to replace the traditional reader payment and author payment models, so as to ultimately achieve that the users can access peer-reviewed journals in the relevant field by freedom and unlimited network.

As an intermediary to provide peer-reviewed service, CERN has been trying to make a conversion of the reader payment model into OA mode thoroughly. *"There is a wind of change blowing and with it the possibility to experiment with new models - in this CERN is perceived as the pioneer of a new publishing paradigm and the SCOAP initiative as a pilot project for future developments in scientific publishing"* said Pēteris Zilgalvis of the European Commission<sup>7</sup>. CERN advocates the establishment of open electronic knowledge repositories worldwide, and made a great progress in the past 6 years.

In 2006 December CERN established SCOAP3 working committee, responsible for the preparation of SCOAP3.

In 2007 July SCOAP3 working group released an union recruitment letter on the Internet. With Germany firstly joining in 2007 August, SCOAP3 had obtained the worldwide (but still European countries dominate) responses and supports until the beginning of 2008, including Italy, France, Spain, Denmark, Norway, Australia, Turkey, to Leah Garner, Israel and other countries<sup>[8]</sup>.

In 2008 the California Digital Library had joined SCOAP3 on behalf of the ten Campuses of UC Berkeley, UC Davis, UC Irvine, UC Los Angeles, UC Merced, UC Riverside, UC San Diego, UC San Francisco, UC Santa Barbara, and UC Santa Cruz. These institutes become the first members to join SCOAP3 in the United States. With SCOAP3's startup and promotability in the United States, there were more than 100 libraries to join SCOAP3 affiliate program in U.S. until January 2010<sup>[9]</sup>.

The alliance had completed fundraising from 12 countries in Europe, with more countries having expressed willingness to join<sup>[10]</sup>. In 2010 August, the Japanese High Energy Accelerator Research Organization (KEK) had issued a statement to support SCOAP3.<sup>11</sup> The support from the Japanese physics community was very important for SCOAP3, indicating a landmark that the Alliance had expanded its forces from Europe and America to Asia, and became a truly global organization<sup>12</sup>.

On November 11, 2010, the Libraries of the major Chinese research institutions in High-Energy Physics (including Library of Peking University, Library of Tsinghua University, Library of Zhejiang University, Library of Chinese University of Science

and Technology, Library of Fudan University, Library of Beijing Normal University, Library of Nankai University, Library of Lanzhou University, Library of Nanjing Normal University, Library of Huazhong Normal University, National Science Library-Chinese Academy of Sciences) wrote an open letter to support the SCOAP3 initiative. They hoped to participate in SCOAP3 on behalf of Chinese libraries, and work with National Science and Technology Library (NSTL) to facilitate the implementation of the SCOAP3 in China<sup>13</sup>. Until that SCOAP3 had counted partners in 24 countries across the world, which had collectively pledged over 7000,000 Euros per annum to SCOAP3, over 70% of its projected budget<sup>14</sup>.

TABLE I. SUCESSFUL TENDERER OF JOURNALS AND PULISHERS FOR SCOAP3

<u>No.</u>	<u>Journal</u>	<u>SCOAP3 Articles (In 2011)</u>	<u>SCOAP3 Percentage of journal (In 2011)</u>	<u>Publisher</u>
<u>1</u>	<u>Physical Review C</u>	<u>107</u>	<u>9.9%</u>	<u>American Physical Society</u>
<u>2</u>	<u>Physical Review D</u>	<u>2989</u>	<u>100%</u>	
<u>3</u>	<u>Physics Letters B</u>	<u>1010</u>	<u>100%</u>	<u>Elsevier</u>
<u>4</u>	<u>Nuclear Physics B</u>	<u>284</u>	<u>100%</u>	
<u>5</u>	<u>Advances in High Energy Physics</u>	<u>28</u>	<u>100%</u>	<u>Hindawi</u>
<u>6</u>	<u>Chinese Physics C</u>	<u>16</u>	<u>7.2%</u>	<u>IOP / Chinese Academy of Sciences</u>
<u>7</u>	<u>Journal of Cosmology and Astroparticle Physics</u>	<u>138</u>	<u>30.9%</u>	<u>IOP/SISSA</u>
<u>8</u>	<u>New Journal of Physics</u>	<u>20</u>	<u>2.7%</u>	<u>IOP/Deutsche Physikalische Gesellschaft</u>
<u>9</u>	<u>Acta Physica Polonica B</u>	<u>23</u>	<u>22.1%</u>	<u>Jagellonian University</u>
<u>10</u>	<u>Progress of Theoretical Physics (To become PTEP)</u>	<u>46</u>	<u>36.2%</u>	<u>Oxford University Press/Physical Society of Japan</u>
<u>11</u>	<u>European Physical Journal C</u>	<u>326</u>	<u>100%</u>	<u>Springer/Società Italiana di Fisica</u>
<u>12</u>	<u>Journal of High Energy Physics</u>	<u>1652</u>	<u>100%</u>	<u>Springer/SISSA</u>

On September 22nd, 2011, SCOAP3 announced that it had supporters of 150 institutions from 28 countries of Africa, America, Asia, Europe and Oceania. These worldwide partners had collectively pledged 80.5% of the SCOAP3 budget of 10,000,000 Euros per annum, fairly shared according to their contributions to High-Energy Physics literature<sup>15</sup>. At the same time, SCOAP3 officially began the biddings to publishers, marking the OA plan to enter a substantive operation stage. SCOAP3 planned to invite the eligible agencies to participate in the bidding procedure, and to determine the bargain in 2012 and to begin to provide service on January 1st, 2013<sup>16</sup>.

In July 2012, National Science Library, Chinese Academy of Science (NSLC) joined the SCOAP3 and pledged financial support to this innovative OA operation. In addition, NSLC had been also actively organizing the institutions of HEP and other major institutions of library alliance to participate in the SCOAP3, in order to promote the continued supports from government of China through the successful implementation of SCOAP3<sup>17</sup>.

By the end of July, 2012, SCOAP3's bidding work had been completed, and had identified 12 journals from 7 publishers to join SCOAP3<sup>18</sup>, as shown in table 1. In September, 2012, contracts between publishers and CERN, acting for the benefit of SCOAP3, was signed<sup>19</sup>. On October 1st, SCOAP3 Open Access Initiative was successfully launched at CERN, and it moved into its implementation phase. These twelve journals will publish all their articles in high-energy physics as open access from 2014, and they had published 90% of articles in 2011<sup>20</sup>.

### SCOAP3 OPERATION AND FUNDING MODEL

Traditional academic journals publishing funds mainly come from the library or individual user subscription fees, as well as the author page charges. SCOAP3 funds the OA to all high quality journal publications in the field of particle physics with the union of HEP funding agencies and libraries, thus replacing the traditional subscription model.

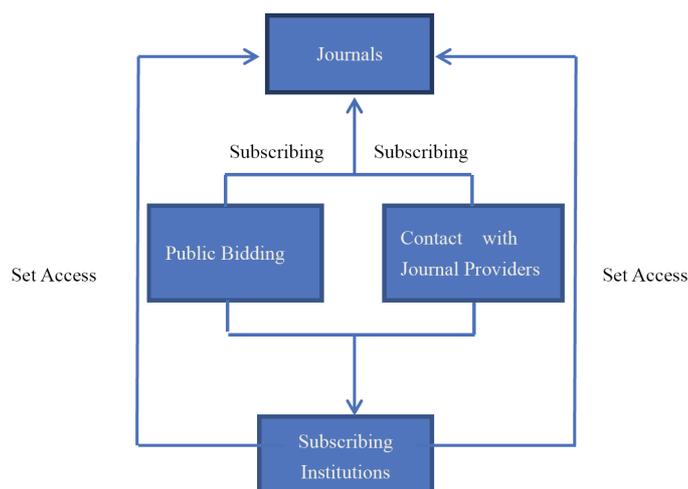


Figure 1. Traditional journal subscription for libraries and research institutions.

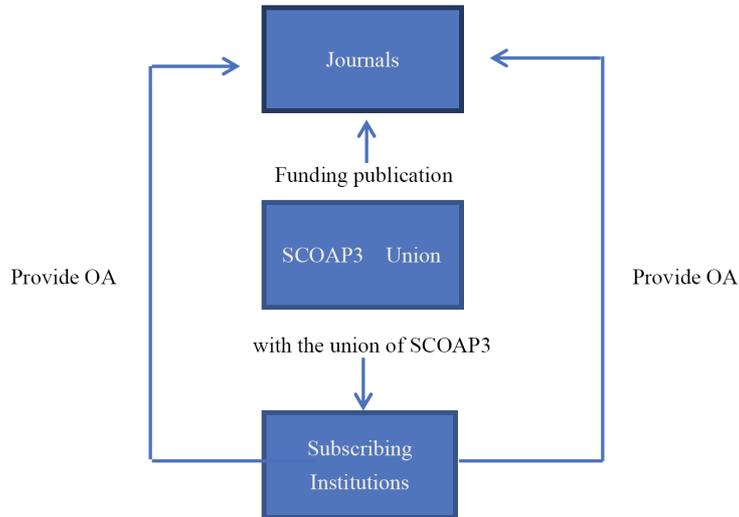


Figure 2. SCOAP's operation.

There are two sources of SCOAP3 funds. One is the charging fees from the participating countries on the basis of the publication scale of the countries, another is reducing the cost of OA to a minimum through the group negotiation. With the funds, SCOAP3 pays for the OA service to publishers according to the Article Processing Charge (APC). The early payment by SCOAP3 for each journal will be based on the individual journal APC and number of SCOAP3 Articles published in the latest year for which complete data are available <sup>21</sup>.

Comparing with these two acquisition models for academic journals shown in Figure 1 and Figure 2, SCOAP3 has obviously become the connection between high quality HEP publishers, author and reader groups.

### CHINA FACING PROBLEMS AFTER JOINING SCOAP3

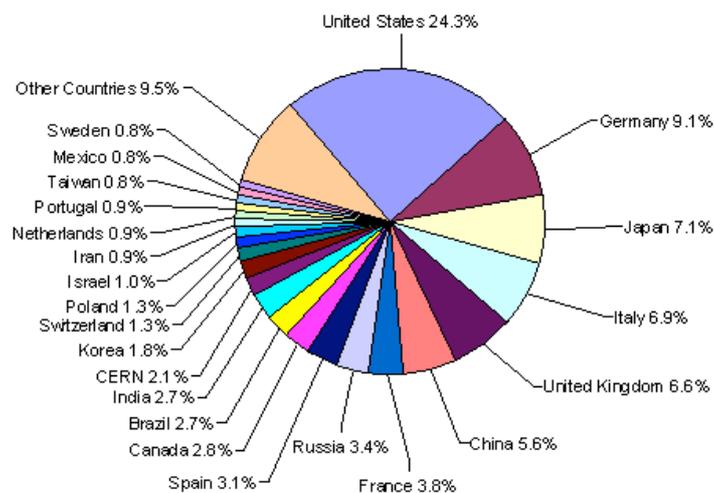


Figure 3. Distribution of HEP articles with countries, averaged from 2005-2006.

### *Academic Evaluation*

SCOAP3 charges fees from the participating countries on the basis of the publication scale of the countries. From Figure 3, we can clearly see that the amount of articles published in China ranked 6<sup>th</sup> in HEP area (behind the United States, Germany, Britain, Japan and Italy), and accounted for 5.6% of the total number of published papers in the world. According to the SCOAP3 charging rule, China has to pay 560,000 Euros initial fee per annum. The number of articles published is undoubtedly huge in China, but the situation of article citations in China is far from optimism. According to the statistical report from Institute of Scientific and Technical Information of China (ISTIC) released in December 2011: 836,300 international papers of Chinese scientists were published in 2011, the number of published papers ranked 2nd in the world, however the papers were cited 5191400 times in total (the cited number ranked 7th in the world), the average citation frequency is 6.21 times for per paper. In contrast, the world's is 10.71 times. Thus there is a large gap between Chinese average citation frequency and the world's.

In recent years, Chinese academic evaluation and prompting mechanisms were usually only measured by numbers of published papers and books, making Chinese researchers one-side pursuing the volume and speed of publications, finally resulting in the scientific research "great leap forward" only in the paper amounts. In SCOAP3, the joining countries have to share the cost according to the number of their published papers. This operation model puts forward higher requirements to the quality of Chinese academic papers and works. This requires Chinese scholars to make self-examination and further to improve the existing academic environment and academic evaluation mechanisms. In addition they are also required to pay special attention to the journal impact factor leading role in academic evaluation, in order to completely eliminate the academic "bubble".

### *Understanding Differences*

SCOAP3 sponsors include CERN, CNRS, DESY, MPG and INFN. These foreign advocates and the main driving forces for the OA plan mainly come from the academic and scientific fields. For example, the Joint Information Systems Committee (JISC) encouraged British authors to publish their articles in the New Journal of Physics for free; in 2005, 46 Academicians of Royal Society jointly sent a letter to the Royal Society to strongly urge the Research Councils UK (RCUK) to put OA into practice, in order to achieve academic and public access to scientific information and develop their potential research ability by the greatest degree. In addition, Nature specially reported SCOAP3 in September 2012.<sup>2</sup>

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15 <sup>2</sup> <http://www.scoap3.org/news/news95.html>

16 WenhuiDailyNov. 12th,2010

17 <http://www.open-access.net.cn/>

18 <http://ec.europa.eu/research/science-society/index.cfm?fuseaction=public.topic&id=1301>

19 <http://www.rcuk.ac.uk/research/Pages/outputs.aspx/>

20 <http://www.scoap3.org/news/news95.html>

21 WenhuiDailyNov. 12th,2010

22 <http://www.open-access.net.cn/>

23 <http://ec.europa.eu/research/science-society/index.cfm?fuseaction=public.topic&id=1301>

24 <http://www.rcuk.ac.uk/research/Pages/outputs.aspx/>

25 <http://en.fi.dk/councils-commissions/the-danish-council-for-independent-research/Final%20Open%20Access%20policy.pdf/>

26 <http://www.nhmrc.gov.au/media/notices/2012/revised-policy-dissemination-research-findings>

27 <http://www.scoap3.org/news/news95.html>

In comparison, Chinese active advocates mostly come from the field of library and information science. The concept of OA is still unfamiliar to scientists in China, and few scientists and academicians have efforts to it. According to statistics from CNKI, the word “SCOAP3” was mentioned in a total of 19 times in the published papers from China during the period from January 2008 to September 2012, but almost all (18 times) appeared in the journals of Library and Information. As to such great contrast between Chinese and foreign attentions, Director of the national science library of Chinese Academy of Sciences Xiaolin Zhang pointed out: “It is a reflection of domestic scientific community’s inertia in the concept, due to the lack of public awareness for scientists—not clear their ultimate significance of research activities”<sup>22</sup>. Thus the understanding differences will be the primary problem for promoting the development of SCOAP3 in China.

Otherwise, Chinese researchers also have concerns about OA. Traditional formal publishing system provides a familiar evaluation and protection mechanisms to researchers. There is stronger mind-set as a “baton” behind the traditional mechanisms: weather is the article published in top journal? What about the journal’s influence? No matter from project application system, or academic evaluation mechanism. Chinese researchers don’t want to have directly conflict with the traditional publishers just because of OA.

### *Problems of Policy Norms*

The famous colleges and universities in the United States (including Harvard University, the Massachusetts Institute of Technology and Duke University), and famous publishing houses such as Springer and Wiley have introduced specific policy to OA. In early 2011, Koninklijke Nederlandse Akademie Van Wetenschappen (KNAW) introduced the policy for OA and long-term digital preservation<sup>23</sup>. On July 17th, 2012, the European Commission published an open sharing policy to announce the OA for the research papers funded by "Horizon 2020 Initiative"<sup>24</sup>. On July 16th, 2012, RCUK published an open sharing policy to require the OA for all research papers produced by the research groups which received full or partial fund<sup>25</sup>. On June 21st, 2012, Danish Council for independent research, Danish Strategic Research Council, Danish National Research Foundation, Danish Advanced Technology Foundation and Danish Council for Technology and Innovation jointly issued an OA policy. This OA policy emphasized to eliminate the barrier from the economical, technical and legal aspects in access to public-funding scientific research results, and require OA for all research published papers produced by projects which received full or part of their funds<sup>26</sup>. On February 22th, 2012, the Australia National Health and Medical Research Council (NHMRC) announced an OA policy for research papers.<sup>27</sup>

OA is not a simple technical problem is not a simple operation, but more associated with the national and institutional policies. “Especially in developing countries, most outstanding research achievements in foreign commercial academic journals, not only make the scientific research as a tool for foreign publishers to obtain high monopoly profits, but also make the preservation of state intellectual property difficult to be achieved. Therefore, to ensure the availability of public research is a kind of social responsibility for scientists, research institutions, government and research funding agencies” Zhang Xiaolin said. Unfortunately, however there is not yet a clear policy to support OA in China. To some extent, China government (the ministry of science and technology, natural science foundation of China) have expressed support policy intentions for knowledge acquisition in the macroscopic level, but which are needed to implement as soon as possible for the implementation of the policy measures. They can refer to international policy which has been successful, and implement the responsibility to specific policy, funding program and knowledge management,

implement the specific management program. It can be seen that the OA strategy at the national level has an important impact on the country OA promotion and development, and OA is difficult to make substantive progress without it.

## **CHALLENGES AND OPPORTUNITIES LIBRARIES**

### *Challenges*

The traditional library services mainly focus on the procurement of resources, data resources, library loan and subject information services. In other words, in the fund flow and information access, library plays an intermediary role between publishers and readers. After joining SCOAP3, the library's procurement funds will be converted to SCOAP3's publication fees. Users do not need the library any longer, but turn to use the network directly to achieve the self-service access to academic information. The traditional functions of the library have been weakened to the maximum extent, both of libraries of professional academic institutions and public libraries will be facing a severe survival crisis.

### *Opportunities*

From library loan service by card style in the past to the resource retrieval systems, from climbing the bookshelves and searching index, to gather material from a variety of database construction and retrieval of information resources and applications, and then to the popular mobile library, the library has been following the technology and the tide of the times, to explore more effectively service model. Joining into the SCOAP3 will bring a wave of OA, the library will constantly adjust the services in practice and find the users' habits in resource usage, and further update more effective service model. Based on the four kernel functions (communication, retrieval, utilization and preservation), the library can improve its capacity from different views. After joining SCOAP3, the library will break the traditional purchase agreements, and no longer passively rely on publication and indexing agencies to access resources. The library can be active and free to discover and identify open resources which are often demanded and used by the users with professional views, and store these resources in the local for a long time as special resources available for the users to understanding, selection, retrieval and utilization. Faced to numerous open sources, the library can carry out various kinds of trainings based on different themes and types, to promote the related resource use, and play the real role of information navigator. From view of resource maintenance, after joining SCOAP3, the library will no longer have to spend significant effort and time on the resource maintenance, and also no longer to pay various subscription fees per year, the saved funds can be used for other services. From the above point of view, after joining SCOAP3 the library will not lose existing positions, but have brighter prospects.

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Anne Gentil-Beccot, "2005, the Year CERN Ran for Open Access", High Energy Physics Libraries Webzine, issue 12, February 2006