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‘TRACKING THE INS AND OUTS OF GREY LITERATURE’

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International Nuclear Information System (INIS) 50 Years of Successful Contribution to Nuclear Science and Society*

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Abstract:

INIS was established in May 1970, as a mechanism to provide access to a comprehensive collection of references to the world's nuclear literature. It has grown from a modest 25-member endeavour to a unique global information resource with a membership of 132 countries. INIS maintains a repository of over 4.4 million bibliographic records, of which 2 million are full text. In 2020, 1.7 million unique visitors made over 2.5 million searches, viewing 4 million web pages.

This paper discusses how INIS operates, the role of its members, the importance of international cooperation, its contribution to nuclear science, its information sharing goals, and the benefits to society of open access to nuclear information.

Keywords: INIS; nuclear information

Introduction

The onset of the cold war in 1947 ushered in an era of fear and uncertainty in nuclear technology. President Dwight D. Eisenhower's *Atoms for Peace* speech to the UN General Assembly in 1953 spurred on the founding of the International Atomic Energy Agency (IAEA) in 1957. The Statute of the IAEA recognizes the need to "...foster the exchange of scientific and technical information on peaceful uses of atomic energy". Thus, with the IAEA Board of Governors approval, INIS was established in May 1970 as a mechanism to provide access to a comprehensive collection of references to the world's nuclear literature.

INIS has grown from a modest 25-member endeavour to a unique global information resource with a membership of 132 countries. It maintains a repository of over 4.4 million bibliographic records, of which 2 million are full text. In 2020, 1.7 million unique visitors made over 2.5 million searches, viewing 4 million web pages.

The peaceful use of atomic energy brings numerous benefits to society. Nuclear technology is used almost everywhere on a daily basis, particularly in the areas of health, environment, water, industrial applications, food and agriculture. INIS offers access to a multitude of documents, reports, articles, and other papers related to science and nuclear technology — a veritable treasure trove for scientists, researchers, government administrators, students and many others. The unique subject area and the sheer volume of information offered by the INIS repository represents a major resource of nuclear information, technological developments and scientific discoveries.

While it is not possible to include all of INIS' achievements throughout its 50 years, this paper will concentrate on the creation of INIS, how it functions, its goals, and its current key role as a global resource of nuclear information.

What is INIS

INIS, as part of the IAEA, is one of the world's largest and most comprehensive repositories of published literature in the field of nuclear science and technology. Operating under special membership arrangements, INIS, currently comprising 132 countries, is a collaborative effort. INIS Liaison Officers (ILOs) are designated by their government authorities and are responsible for collecting their national literature and preparing input to the INIS repository, disseminating information contained in INIS products, and promoting INIS within their national boundaries. Preservation and dissemination are centralized within the INIS Secretariat in Vienna.

The INIS repository contains bibliographic references and full-text documents of conventional and non-conventional (grey) literature, including scientific and technical reports, conference proceedings, patents and theses.

* First published in the GL2020 Conference Proceedings, February 2021.

INIS subject scope covers all areas of IAEA activities, including 50 related categories. The highest areas of input can be seen below (Fig. 1).



Figure 1: INIS main subject areas

INIS goals

INIS' mandate under the IAEA is to:

- foster the exchange of scientific and technical information on the peaceful use of nuclear science and technology
- collect, process, preserve and disseminate nuclear information
- increase awareness in Member States of the importance of maintaining efficient and effective systems for managing nuclear information resources
- assist Member States with capacity building and training
- provide information services and support to the IAEA and its Member States

INIS also maintains a multilingual thesaurus in Arabic, Chinese, English, French, German, Japanese, Russian and Spanish, providing translations of thousands of technical terms that help navigate and search the collection.

INIS activities are organized in cooperation with its Member States. In addition to regular operational contact with ILOs, consultative meetings take place biennially to discuss policy issues and the overall direction of INIS. The main activities of INIS include:

- Information collection
 - Collect and process bibliographic metadata and full texts of nuclear literature published in IAEA Member States
- Information preservation
 - Electronically preserve non-conventional or 'grey' literature, such as nuclear-related documents, policy and technical reports, and other full-text publications from Member States and international organizations
- Information sharing
 - Ensure free access of the INIS collection to Internet users around the world
- Nuclear knowledge organization
 - Create and maintain the INIS Thesaurus as a major tool for describing nuclear information and knowledge in a structured form
- Capacity building
 - Assist INIS members in improving their effectiveness in nuclear information management

Creation of INIS

With an initial 25 members, the collaborative effort to collect nuclear literature in 1970 was modest — 3950 records were entered into the database in the first year. A seemingly small step which marked a significant beginning for the leading global nuclear information system that INIS would become.

Never had such a geographically and linguistically diverse group of nations cooperated to offer, from a central repository, free, easy to find, and trusted information to scientists, researchers, information specialists, students, government officials, and other users. Initially, the inputting process was tedious and required a lot of manpower. Member States would mail paper documents to the IAEA headquarters in Vienna, where they would be photographed and converted to microfiche. Afterwards, INIS staff would check the incoming information, combine it into a single computer-readable file and distribute it to Member States as machine-readable tapes and semi-monthly abstracting journals.

INIS today

Thanks to the continued cooperation with its ever-growing number of global members and the implementation of innovations in technology throughout the years, INIS has seen dynamic growth in the number of records input to its repository — currently 4.4 million records. Over 100,000 new records are added each year. Improvements in technology include digitalization, the deployment of modern databases and search engines, automated classification, artificial intelligence and machine learning, and harvesting. Figure 2 shows the evolution of records input by country over the last 50 years.

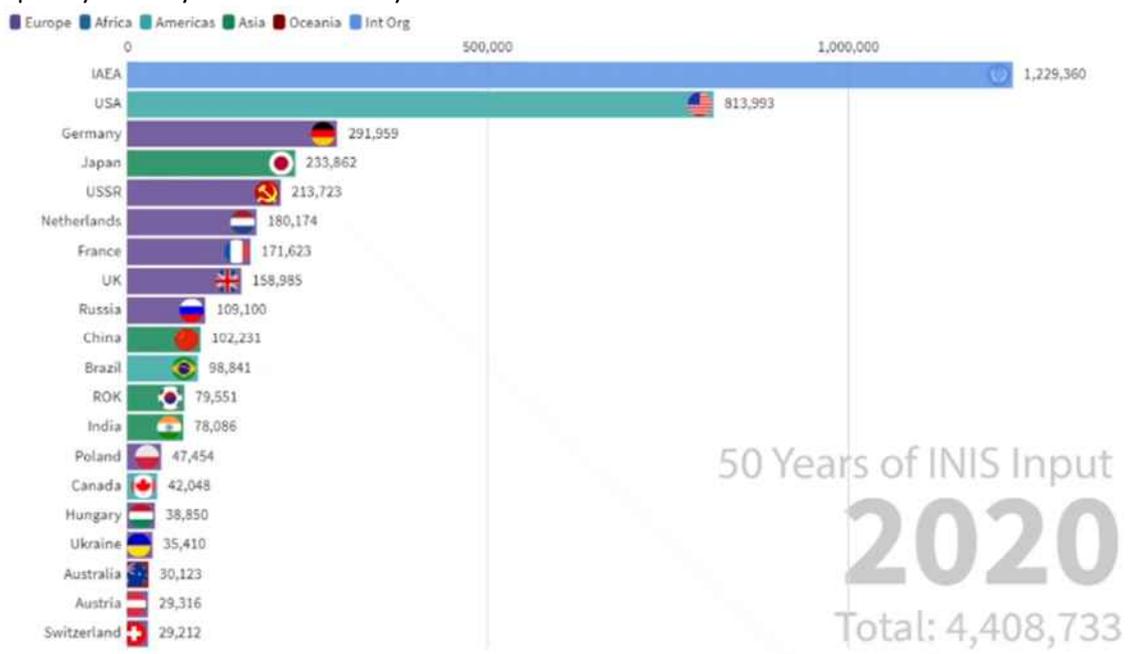


Figure 2: 50 years of INIS input

One of INIS’ greatest assets is its collection of more than 2 million full text documents. These can be downloaded directly from INIS servers or through URL or DOI links provided as a part of the INIS bibliographic record.

Another important characteristic of INIS is its open and free accessibility and availability. Statistics show that the repository has been accessed from every corner of the world (Table 1). Its target audience includes researchers, students, government officials, journalists, and the general public.

LAST 10 YEARS

1. United States	11. Australia
2. India	12. Russia
3. United Kingdom	13. Italy
4. Germany	14. Pakistan
5. Japan	15. Indonesia
6. Canada	16. Turkey
7. Korea, Republic of	17. Malaysia
8. Brazil	18. Spain
9. France	19. Philippines
10. Iran	20. Egypt

Table 1: Top 20 countries of users in last 10 years

INIS has a proven record as an excellent tool for the preservation of nuclear information. IAEA Member States have been able to recover from INIS valuable information that has been lost or damaged. One of these success stories is the Yerevan Physics Institute (YerPhi) in Armenia, whose physical collection had been damaged during storage. Thankfully, the information had been digitally preserved in the INIS repository making it possible to not only recover the information, but to set up a dedicated website linking to the documents in INIS.

Challenges and Opportunities

The challenges that INIS faces today can also be opportunities in its role as a key player in the world of information sharing and preservation.

The biggest challenge INIS faces are from Google and Google Scholar. The Google challenge is two-fold. The first challenge is external, as seen through user statistics — the number of users coming directly to INIS to search for what they need. It is generally assumed that everything can be found by searching Google and therefore not worth further time and effort searching elsewhere. The second challenge is internal — within our organizations — with a reluctance to invest financially in internal information management operations since it seems that everything is already available on the Internet, such as Google.

INIS has benefited from Google Scholar by having all of its documents indexed and made available through their search engine. Still, it should not be forgotten that without INIS having spent 50 years collecting this information, it would not now be widely available and easily accessible. It is important to recognize that documents need to be prepared and input online by someone in order for search engines to find them.

Another challenge arises from the current economic situation, which impacts INIS Member States, and, by extension, the IAEA budget. Despite acknowledging and praising the importance of information, it becomes a vulnerable target in budget cuts. Economic circumstances negatively impact the readiness of Member States to invest in collecting their national information resources and making them available to INIS. This directly impacts the level of funds available to INIS to maintain its repository.

The final challenge is unprecedented, unpredictable, quickly evolving and usually very expensive technological innovations. Digital transformation requires substantial hardware and software updates, changes in established work procedures and methodologies, and upgrades to evolving workforce skills — which necessitates substantial training and re-training.

Wherever challenges are encountered, the opportunities that come with them should also be examined. The greatest opportunity for INIS lies with the trust its members hold in this joint venture, proven throughout 50 years, millions of records, and its millions of users. Its huge collection of bibliographic and full-text records is a remarkable asset that needs to be maintained, reused, repackaged, and repurposed in multiple ways to offer new possibilities and opportunities.

INIS' popularity with its user base is also an immense asset. In 2020 alone, more than 1.7 million unique users visited INIS and performed 2.5 million searches, opened 4 million pages

and downloaded almost 200,000 documents. INIS' relationship with its user base needs to be nourished by offering high quality, relevant, reliable, and trustworthy information.

The INIS Thesaurus, with over 31,000 terms, offers another opportunity to continue its transformation into modern taxonomies and ontologies. These are regarded as the main building blocks for web-based semantic applications and the use of artificial intelligence.

Conclusion

INIS celebrates its 50th anniversary recognizing its many achievements, and with high hopes and expectations. As in the previous half century, INIS is set to play a key role as a global resource of nuclear information in the coming decades.

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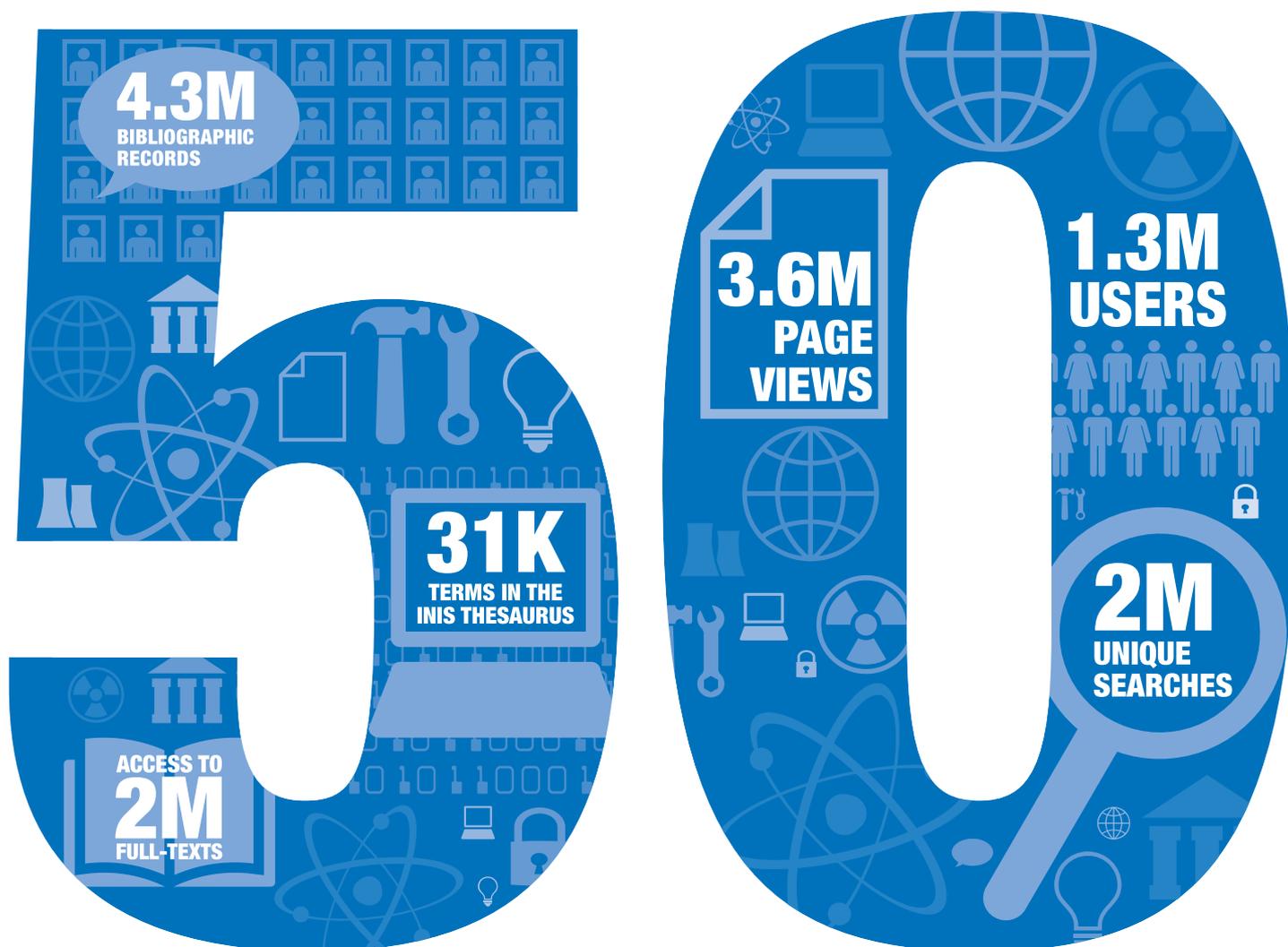
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50 YEARS OF INIS

THE WORLD'S TRUSTED NUCLEAR REPOSITORY



Looking for nuclear information?

Want to preserve your nuclear information?

INIS CAN HELP!

The International Nuclear Information System (INIS) was established in 1970 “to foster the exchange of scientific and technical information on peaceful uses of atomic energy”.

132 countries and 14 international organizations contribute their national nuclear literature, making it the world’s leading open access repository for nuclear science and technology literature.

Explore INIS and find a wealth of information on physics, radiation, climate change, health, etc. **Preserve** your nuclear information by storing it in our trusted repository.