FAPM

The 13th Funding Agency Presidents' Meeting

2nd October 2023 • Kyoto International Conference Center

Organized by Japan Science and Technology Agency (JST) / Deutsche Forschungsgemeinschaft (DFG)

SUMMARY REPORT

Introduction

The Funding Agency Presidents' Meeting (FAPM) brings together the heads of research funding organizations during the annual Science and Technology in Society (STS) forum in Kyoto. The 13th FAPM focused on "the role of funding agencies in the development and mobility of talent", and was attended by 55 representatives from 33 countries and regions.

JST's President Dr. Kazuhito Hashimoto opened the meeting and emphasized that fostering talent capable of addressing emerging technologies such as generative AI is funding agencies' common and urgent challenge and it is important for funding agencies to share their diverse knowledge and experiences with each other. DFG President Prof. Dr. Katja Becker, represented by Secretary General Dr. Heide Ahrens, commented on the importance of appropriate talent development and brain circulation to handle the unprecedented progress in science and technology. She also addressed the issue that a modern technology-driven society needs the arts and the social sciences to understand how science and technology could be navigated to cope with real-world challenges.

Prof. Peter Norvig, Distinguished Research Fellow of Stanford University and Research Director of Google Inc., provided the keynote speech to set the tone for the subsequent discussions. During his speech, he highlighted the extraordinary pace of development within the AI field, even for someone with his extensive experience. The AI field attracts top students, and there is significant interest from funding agencies, large technology companies, venture capitals, and others. However, this growth also brings about confusion and uncertainty, such as which job skills may be overtaken by AI in the future, what skills will be required, and which areas should be funded. To comprehend the direction in which this technology is heading and to exert better control, Prof. Norvig emphasized that partnerships involving government regulation, corporate self-regulation, and third-party certification are essential. He insisted that it would be beneficial for everyone if international collaboration could harmonize regulations to some extent across different countries. One effective way to bridge the gap, as Prof. Norvig argued while providing examples based on his own experiences, is to enhance mutual understanding through "healthy" student exchanges. He also mentioned that sharing facilities is beneficial for international collaboration.

In conclusion, Prof. Norvig emphasized the significance of Human-Centered AI, highlighting the importance of focusing on human aspects. He underscored the necessity of nurturing researchers and engineers capable of handling AI as a tool with a profound understanding of its social impact. Prof. Norvig closed his speech by noting the pivotal role that funding agencies could play in this endeavour.

Before the table discussion summaries, Prof. Hiroshi Komiyama, Chairman of the STS forum, stated that STS forum Annual Meeting has reached its 20th iteration and has garnered attention in various media. He emphasized that the discussions taking place at the STS forum are crucial for the sustainability of the Earth and humankind, and urged participants to actively communicate with their respective national media.

Discussion Summaries

Two key questions were discussed at tables of five to six participants, and their conclusions were presented by table rapporteurs at the end of the meeting. Some of the common themes have been summarized below. See Annex II for a more detailed breakdown of these conclusions.

1. What role should funding agencies play to address emerging technology fields, especially in terms of talent development?

Flexibility and agility

Although supporting projects rather than individuals is fundamental for funding agencies, there is a need for flexible thinking and approaches that go beyond the boundaries of traditional funding particularly in the realm of talent development in emerging technological fields. This also applies to policies. Furthermore, there are both top-down and bottom-up approaches to international collaboration, and it is crucial to strike a balance and explore appealing schemes without leaning too heavily in either direction.

Broad/interdisciplinary talent development

Talent development should be broad and interdisciplinary. It is essential that social sciences, law, and ethics are included in the scope in addition to science-based education. Moreover, it is crucial to establish multidisciplinary and international research networks in emerging technological fields.

Education

To address the rapid development of emerging technology, it is essential to begin teaching and promoting a scientific approach from an early age. Furthermore, funding agencies should collaborate to ensure that the emerging technology is accessible and promote education for all. It is also vital to collaborate with industry and develop training programs to cultivate specialized talent. Additionally, there is a need to encourage young researchers to develop soft skills.

2. What role should funding agencies play to promote brain circulation that benefits our countries in a fair and equitable manner?

Bi-directional brain circulation

Brain circulation necessitates a bi-directional exchange rather than brain drain. It is imperative to strategically plan well in advance to encourage researchers from the Global South to return to their home countries. This may involve considering initiatives such as industrialized PhD programs and internships. Additionally, fostering collaboration among countries within the Global South is equally crucial. Engagement with the diaspora is indispensable for the maintenance of international networks.

Industry-acadmia collaboration

Academia-industry collaboration is crucial for international brain circulation, and funding agencies should establish attractive schemes that enhance the mobility between academia and industry. Furthermore, since each funding agency has different methods and approaches, strengthening collaboration among the agencies is essential.

Infrastructure

To ensure that researchers can continue their research even after returning to one's own country or upon project completion, it is important to establish and develop infrastructure. Particularly for large infrastructure, open access is crucial. In addition, there is a need to develop new platforms for researchers to get acquainted with one another and collaborate on common objectives. However, in the context of international brain circulation, the emphasis should be placed on cooperation in mutually compelling projects rather than physical circulation.

Open and secure collaboration

Mobility is important for the advancement of science and technology, as well as mutual understanding. However, in recent times, concerns such as national security and intellectual property have been on the rise. Therefore, international collaboration should be as open as possible while ensuring the necessary level of security. This makes policy discussions crucial. Furthermore, international collaboration exists on various scales, from local to global. It is important for each funding agency and government to understand what they want to achieve from different forms of collaboration and to formulate their strategies accordingly.

Annex I: Meeting Format

Date & Time: Monday 2 October 2023, 12:50-14:10 JST

Venue: Room A, Kyoto International Conference Center

Chairs: Dr. Kazuhito Hashimoto, President, Japan Science and Technology Agency (JST)
Prof. Dr. Katja Becker*, President, German Research Foundation (DFG)

Keynote: Prof. Peter Norvig, Distinguished Research Fellow; Research Director, Stanford University; Google Inc.

Participants: 55 - from 33 countries/regions (see Annex III for full list)

* represented by Dr. Heide Ahrens, Secretary General (DFG)

12:50-12:55	Opening remarks	Dr. Kazuhito Hashimoto, Dr. Heide Ahrens
12:55-13:00	Explanation of meeting format	Secretariat
13:00-13:15	Keynote speech	Prof. Peter Norvig
13:15-13:45	Workshop-style discussions	
13:45-14:05	Table discussion summaries	Table rapporteurs
14:05-14:07	Greeting	Dr. Hiroshi Komiyama
14:07-14:10	Concluding remarks	Dr. Kazuhito Hashimoto, Dr. Heide Ahrens

Participants sat at tables of up to six members, discussed the two key questions, then presented their tables' conclusions to the wider group.

Annex II: Table Rapporteur Notes

Table 1

1. Necessity to promote/stimulate interdisciplinarity in Artificial Intelligence research;
2. Promote brain circulation in multiple scales;
3. Be connected with society/ethical considerations;
4. Scale up Artificial Intelligence in all fields of knowledge;
5. Equitable access to the emerging technologies, in other words, "Education for all", according to SDG #4.

Table 2

Q1. What role should funding agencies play to address emerging technology fields, especially in terms of talent development?

- There are 2 main approaches. The first one is bottom-up approach; since some funding agencies believe that the researchers are expert in their field and they should know very well the emerging technologies in their area of expertise.
- The second approach is a top-down one which having 2 subcategories. Firstly, some funding agencies identify the global trend as their emerging technologies such as Generative AI, Genetic engineering, etc. Secondly, some funding agencies identify the emerging technologies as their country needs, for example, nuclear reactor design in Slovakia.

Q2. What role should funding agencies play to promote brain circulation that benefits our countries in a fair and equitable manner?

- All members agree that brain circulation is very important. We believe that FA should support researchers more than provide funding. We have to develop new platforms to make researchers know each other or make them engage with the common targets.
- For the issue of a fair and equity manner, we were discussing about the exchange programs between global north and global south. All parties should co-design the program to make suitable environment that will create no brain drain problem. For examples, we should provide the suitable working environment of the researchers in global south countries to make sure that they will come back after the end of fostering program in global north countries.

Table 3

- Currently, it has been assessed that artificial intelligence is overrated. It has been emphasized that artificial intelligence is not an outcome but a tool.
- It has been indicated that for artificial intelligence to make an impact, a science-based approach is required.
- For a science-based approach, early-stage science-based education (such as STEM, etc.) is necessary, and it has been assessed that only in this way can artificial intelligence become more significant in the future.
- In addition to science-based education, the social and human aspects of the subject should also be addressed.
- It is believed that progressing with a science-based plan is crucial for the future of artificial intelligence.
- Participants have concurred that brain circulation is inevitable, but it should not evolve into brain drain.

Table 4

- Funding Agencies are focused mainly to finance projects
- There is inside Agencies programs devoted to brain circulation but it is not considered and perceived to develop talent as their main role.
- In order to evaluate emerging technologies we need Agencies to mix panel from engineers and scientists and not independent subject panel as it is today.
- The majority of Funding Agencies have mobility programs for scientists but it is difficult sometimes to incorporate universities, as traditional institutions, to this circulations.

Table 5

Q1. What role should funding agencies play to address emerging technology fields, especially in terms of talent development?

- Talent development must be broad, not only technology, but a mix with social sciences, ethics and legal.
- Important with a broad science foundation, so that graduates can adapt and are open for change.
- Continued education is important for lifelong learning.

Q2. What role should funding agencies play to promote brain circulation that benefits our countries in a fair and equitable manner?

- Science is global in its DNA.
- Must be brain circulation through mobility and research exchange.
- Mobility is good for innovation and mutual understanding, Science Diplomacy.
- However, there is increasing concern for national security, IPR, and human rights violations.
- It's important that international cooperations are as open as possible, but as secure as necessary.
- There is a grey zone between white and black areas in international cooperation, thus policy discussions are important.
- Policy discussions can hopefully result in international codes of conduct for international projects.

Table 6

- Challenge to fund new emergent areas due to peer-review system which tends to lock into the present
- Important to balance top-down thematic focus areas and also bottom-up investigator-led research to preserve enough space for new emergent areas
- Conversely, funders could do more to understand why specific areas, e.g. physics-related fields, may be seeing less "demand" from research groups. It could be due to the diminishing of physics being taught in middle and high school, which also means generating less physics-trained researchers, which then impacts the number of grants put up in that field.
- Actively send researchers outside of one's country: there is inertia
- Try to promote return of talent to their home countries at some point, in order for more equitable cross-flow of talent internationally
- To try to take in displaced scientists from Ukraine to preserve their intelligentsia who can help Ukraine rebuild after the war

Table 7

FUNDING AGENCIES SHOULD SUPPORT:

1. International multidisciplinary research networks aiming at a) facilitating and promoting student mobility & training especially in fields such as (but not limited to) AI, quantum computing, IOT, synthetic biology & energy (fusion); b) open access to large expansive infrastructure; c) promoting public-private sector partnerships.
2. Promote & facilitate south-south exchange and collaborations
3. Facilitate the engagement of diaspora.

Table 8 (from transcript)

- International mobility/collaboration between academia-industry should be increased.
- FAs should attract young talent to emerging technology by making specific schemes.
- FAs should increase collaboration among themselves.
- FAs should provide infrastructure for researchers so they can continue their research even after the exchange and/or the project end.

Table 9

Q1. What role should funding agencies play to address emerging technology fields, especially in terms of talent development?

All of us accepted the importance of building collaboration across countries. This however should be shaped within decisions on research priorities at the highest level, and of course a balance needs to be struck between support for pure curiosity led research and collaborative results focussed research, and collaboration across the corporate - academia boundaries. However, many of the new developments - such as Generative Language Models and other forms of AI, and in other

new technologies come from companies. So there is an evident need to encourage industry academia collaboration.

The actual implementation of this broad agreement however can be expressed with different strategic approaches. For example

- In Europe grants for PhDs jointly funded between targeted institutions and the agencies
- In Canada challenge programs are being mounted with funding that can be applied to collaboration not only in Canada but between researchers in Canada and researchers in other countries.
- In Thailand co funding is deployed with researchers from each country being funded by their respective countries to collaborate on key collaborations.

Q2. What role should funding agencies play to promote brain circulation that benefits our countries in a fair and equitable manner?
Since we agree on the necessity for collaboration the term "Brain circulation" is interesting - it does not necessarily mean that physical circulation is the key to the benefits mentioned. The key is not necessarily physical circulation but collaboration on mutually compelling projects and actions. It is collaboration with purpose supported by the occasional physical meeting. Those physical meetings should be focussed on networking and collaboration generation.

For example:

- In Japan, young people are very comfortable living in Japan, and so can be reluctant to work elsewhere. So have created a program called ASPIRE, to develop these sustainable partnerships.

- In Canada a lot of people move to the US partly because they are better paid. Need to look at parity in relative income. Want the companies to stick to Canada, not to lose them. Create an economic ecosystem where companies collaborate to

- In Europe there are policies in place to encourage students from other countries to eventually return home. In Thailand it is understood that it is possible to collaborate together without the brain drain. Just see each other physically just once a year with the collaboration supported by electronic means.

Finally, there are different scales of collaboration - local, disciplinary, cross-disciplinary, cross university-companies, and then national, regional and global. Agencies and governments need to know what they aspire to gain from these different scales and styles of collaboration and to shape their strategies accordingly.

Table 10

Q1. What role should funding agencies play to address emerging technology fields, especially in terms of talent development?

- need to be reactive as technologies emerge unexpectedly - agility in terms of funding to fill gap - upskilling
- public funders don't take risk - much secure possibility of taking risks - create agility in funding agencies - mission- driven research becomes important
- program must address challenges but also have bottom up aspect, can't just have top down must be a mixture
- young generation must be trained for technology/ ethics / enabling to develop their leadership / ECRs in charge of projects
- students must be employable, adaptable to rapid changes
- organized training program - with professional development, industry connections
- need to carve out time to develop talent - competitiveness is a stress
- soft skills needed

Q2. What role should funding agencies play to promote brain circulation that benefits our countries in a fair and equitable manner?

- brain drain is an issue (salaries).
- funding and enabling ECR so that they can circulate, family expenses etc.
- four year grant to spend considerable time at another university - promote mobility
- developing countries lose talent, how to make it bi-directional
- for developing countries: provide funding to welcome promising PIs to establish their programs
- create opportunities to attract back students
- co-tutelle - double degree - get credit in both places - helps retain
- industrial PhDs globalize - can circulate - co-ops/internships
- training OK but how to utilize them? Need capacity to retain the talent/investments
- ICTP - creates capacity in Africa and developing world.

Annex III: Table Members

* Table Chair * Table Rapporteur

Table	Name	Position	Organisation	Country
1	Marcio DE CASTRO SILVA FILHO *	Scientific Director	São Paulo Research Foundation (FAPESP)	Brazil
	Timo METSA-TOKILA	Executive Director	Business Finland	Finland
	Kazuhito HASHIMOTO *	President	Japan Science and Technology Agency (JST)	Japan
	Zbigniew BŁOCKI	Acting Director	National Science Centre (NCN)	Poland
	Kian Teik BEH	CEO	National Research Foundation (NRF)	Singapore
	Dame Ottoline LEYSER	Chief Executive	UK Research and Innovation (UKRI)	U.K.
2	Mahmoud M. SAKR *	President	Ministry of State for Scientific Research	Egypt
	Antoine PETIT	Chairman and CEO	National Center for Scientific Research (CNRS)	France
	Yoshinao MISHIMA	President	Japan Agency for Medical Research and Development	Japan
	Martin VENHART	Vice President	Slovak Academy of Sciences	Slovakia
	Pongpan KAEWTATIP *	Vice President for Science, Research and Innovation	Thailand Science Research and Innovation (TSRI)	Thailand
	Heide AHRENS	Secretary General	German Research Foundation (DFG)	Germany
3	Maria LEPTIN	President	European Research Council (ERC)	Belgium
	Pavel KABAT *	Secretary-General	International Human Frontier Science Program Organization (HFSPO)	France
	Tadashi SATO	Director-General	National Agriculture and Food Research Organization	Japan
	Domènec ESPRIU	Director	State Research Agency (AEI)	Spain
	Hasan MANDAL *	President	The Scientific and Technological Research Council of Türkiye	Turkey
	László LENGYEL	Vice-president	National Research, Development and Innovation Office of Hungary (NKFIH)	Hungary

4	Ursula JAKUBEK	Executive Vice President	Austrian Science Fund (FWF)	Austria
	Hanoch GUTFREUND *	Executive Committee	Israel Science Foundation (ISF)	Israel
	Francisco Javier Ponce MARTÍNEZ *	Director General	CDTI	Spain
	Pham Dinh NGUYEN	Director	National Foundation for Science and Technology Development (NAFOSTED)	Vietnam
	Tsuyoshi SUGINO	President	Japan Society for the Promotion of Science (JSPS)	Japan
5	Thierry DAMERVAL	President and CEO	French National Research Agency (ANR)	France
	Andreas GÖTHENBERG *	Executive Director	STINT, The Swedish Foundation for International Cooperation in Research and Higher Education	Sweden
	Sukit LIMPIJUMNONG	President	National Science and Technology Development Agency	Thailand
	Hideyuki TOKUDA	President	National Institute of Information and Communications	Japan
	Anna Fontcuberta i MORRAL *	Member of the Presiding Board	Swiss National Science Foundation (SNSF)	Switzerland
6	Signe RATSO *	Deputy Director-General	European Commission	EU
	Lars HULTMAN	Chief Executive Officer	The Swedish Foundation for Strategic Research (SSF)	Sweden
	Marcel VAN DE VOORDE	Prof. & Executive Advisor to the President and CEO	IMEC Technology Institute - Catholic University Leuven	Belgium
	Kikuo KISHIMOTO	Executive Director	New Energy and Industrial Technology Development Organization (NEDO)	Japan
	Frederick CHEW *	CEO	Agency for Science, Technology and Research (A*STAR)	Singapore

7	Rémi QUIRION *	CEO	The Fonds de recherche du Québec	Canada
	Gintaras VALINČIUS	Chairman	Research Council of Lithuania	Lithuania
	Darja ISAKSSON	Director General	VINNOVA (Sweden's Innovation Agency)	Sweden
	Wiparat DE-ONG	Executive Director	National Research Council of Thailand (NRCT)	Thailand
	Mohamed Hag Ali HASSAN *	President	The World Academy of Sciences (TWAS)	Sudan
8	Mari Sundli TVEIT *	CEO	Research Council of Norway (RCN)	Norway
	Chuan Poh LIM	Chairman of the Board	Singapore Food Agency (SFA)	Singapore
	André KUDELSKI	President	Innosuisse - Swiss Innovation Agency	Switzerland
	Theodoros LOUKAIDIS	Director General	Cyprus Research and Innovation Foundation	Cyprus
	Peter NORVIG	Distinguished Education Fellow; Research Director	Stanford University; Google Inc.	U.S.A.
	Agus HARYONO *	Deputy Chairman for Facilitation of Research and Innovation	National Research and Innovation Agency (BRIN)	Indonesia
9	Melanie CULLINS	Director General	National Research Council Canada (NRC)	Canada
	Marc SCHILTZ	CEO	Luxembourg National Research Fund (FNR)	Luxembourg
	Jim FALK *	Honorary Professorial Fellow	Melbourne University	Australia
	Sompong KLAYNONGSRUANG *	President	Program Management Unit for Human Resources &	Thailand
	Hiroyuki KANEKO	Vice President	Japan Science and Technology Agency (JST)	Japan
10	Alejandro ADEM *	President	Natural Sciences and Engineering Research Council of Canada (NSERC)	Canada
	Maria Chiara CARROZZA	President	National Research Council (CNR)	Italy
	Kwang Bok LEE *	President	National Research Foundation of Korea (NRF)	Korea
	Johan KUYLENSTIERNA	Director General	Formas, the Swedish Research Council for Sustainable Development (Sweden)	Sweden
	Rami NIAZY on behalf of Munir M. ELDESOUKI, President	Acting Vice Governor	King Abdulaziz City for Science and Technology (KACST)	Saudi Arabia
	Shigeo MORIMOTO	Vice President	Japan Science and Technology Agency (JST)	Japan