

University Fellowship Founding Project for Innovation Creation in Science and Technology (MEXT)

## Application call: FY2022 Fellowship Program

“Fellowship program to foster architects who lead super-smart society with co-creating innovative solutions to “X-Care” social issues”

“Nambu-Einstein Fellowship Program”

“Fellowship program to foster international Ph.D. holding researchers through materials innovations”

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Faculty of Liberal Arts and Sciences  
Chair of Fellowship Project Steering Committee



- ① Objective of Fellowship Program
- ② Provided Support
- ③ Eligible Candidates (List of Majors)
- ④ Selection and Schedule



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## 科学技術・イノベーション基本計画(概要)

### 現状認識

#### 国内外における情勢変化

- 世界秩序の再編の始まりと、科学技術・イノベーションを中核とする国家間の覇権争いの激化
- 気候危機などグローバル・ファンデンダの脅威の現実化
- ITプラットフォームによる情報独占と、巨大な富の偏在化

#### 新型コロナウイルス感染症の拡大

- 国際社会の大きな変化
  - 感染拡大防止と経済活動維持のためのスピード感のある社会変革
  - サプライチェーン寸断が迫る各国経済の持続性と強靭性の見直し
- 激変する国内生活
  - テレワークやオンライン教育をはじめ、新しい生活様式への変化

#### 科学技術・イノベーション政策の振り返り

- 目的化したデジタル化と相対的な研究力の低下
  - デジタル化は既存の業務の効率化が中心、その本来の力が未活用
  - 論文に関する国際的地位の低下傾向や厳しい研究環境が継続
- 科学技術基本法の改正
  - 科学技術イノベーション政策は、自然科学と人文・社会科学を融合した「総合知」により、人間や社会の総合的理解と課題解決に資するものへ

「グローバル課題への対応」と「国内の社会構造の改革」の両立が不可欠

### 我が国が目指す社会(Society 5.0)

#### 国民の安全と安心を確保する持続可能で強靭な社会

##### 【持続可能性の確保】

- SDGsの達成を見据えた持続可能な地球環境の実現
- 現代のニーズを満たし、将来の世代が豊かに生きていける社会の実現

##### 【強靭性の確保】

- 災害や感染症、サイバーテロ、サプライチェーン寸断等の脅威に対する持続可能で強靭な社会の構築及び総合的な安全保障の実現

#### 一人ひとりの多様な幸せ(well-being)が実現できる社会

##### 【経済的な豊かさや質的な豊かさの実現】

- 誰もが能力を伸ばせる教育と、それを活かした多様な働き方を可能とする労働・雇用環境の実現
- 人生100年時代に生涯にわたり生き生きと社会参加し続けられる環境の実現
- 人々が夢を持ち続け、コミュニティにおける自らの存在を常に肯定し活躍できる社会の実現

この社会像に「信頼」や「分かち合い」を重んじる我が国の伝統的価値観を重ね、Society 5.0を実現

国際社会に発信し、世界の人材と投資を呼び込む

#### Society 5.0の実現に必要なもの

サイバー空間とフィジカル空間の融合による持続可能で強靭な社会への変革

新たな社会を設計し、価値創造の源泉となる「知」の創造

新たな社会を支える人材の育成

「総合知による社会変革」と「知・人への投資」の好循環

### Society 5.0の実現に向けた科学技術・イノベーション政策

- 総合知やエビデンスを活用しつつ、未来像からの「バックキャスト」を含めた「フォーサイト」に基づき政策を立案し、評価を通じて機動的に改善
- 5年間で、政府の研究開発投資の総額 30兆円、官民合わせた研究開発投資の総額 120兆円 を目指す

#### 国民の安全と安心を確保する持続可能で強靭な社会への変革

- (1) サイバー空間とフィジカル空間の融合による新たな価値の創出
  - ・ 政府のデジタル化、デジタル庁の発足、データ戦略の完遂（ハースレジストリ整備等）
  - ・ Beyond 5G、ス/ロ/ユ、宇宙システム、量子技術、半導体等の次世代インフラ・技術の整備・開発
- (2) 地球規模課題の克服に向けた社会変革と非連続なイノベーションの推進
  - ・ カーボンニュートラルに向けた研究開発（基金活用等）、循環経済への移行
- (3) レジリエントで安全・安心な社会の構築
  - ・ 脅威に対応するための重要技術の特定と研究開発、社会実装及び流出対策の推進
- (4) 価値共創型の新たな産業を創出する基盤となるイノベーション・エコシステムの形成
  - ・ SBIR制度やアントレ教育の推進、スタートアップ拠点都市形成、産学官共創システムの強化
- (5) 次世代に引き継ぐ基盤となる都市と地域づくり（スマートシティの展開）
  - ・ スマートシティ・スマートシティの創出、官民連携プラットフォームによる全国展開、万博での国際展開
- (6) 様々な社会課題を解決するための研究開発・社会実装の推進と総合知の活用
  - ・ 総合知の活用による社会実装、エビデンスに基づく国家戦略の見直し・策定と研究開発等の推進
  - ・ ムーンショットやSIP等の推進、知財・標準の活用等による市場獲得、科学技術外交の推進

※AI技術、バイオテクノロジー、量子技術、マテリアル、宇宙、海洋、環境エネルギー、健康・医療、食料・農林水産業等

#### 知のフロンティアを開拓し価値創造の源泉となる研究力の強化

- (1) 多様で卓越した研究を生み出す環境の再構築
  - ・ 博士課程学生の処遇向上とキャリアパスの拡大、若手研究者ポストの確保
  - ・ 女性研究者の活躍促進、基礎研究・学術研究の振興、国際共同研究・国際頭脳循環の推進
  - ・ 人文・社会科学の振興と総合知の創出（ファンディング強化、人文・社会科学のDX）
- (2) 新たな研究システムの構築（オープンサイエンスとデータ駆動型研究等の推進）
  - ・ 研究データの管理・利活用、スマートラボ・AI等を活用した研究の加速
  - ・ 研究施設・設備・機器の整備・共用、研究DXが開拓する新しい研究コミュニティ・環境の醸成
- (3) 大学改革の促進と戦略的経営に向けた機能拡張
  - ・ 多様で個性的な大学群の形成（真の経営主体への転換、世界と伍する研究大学への更なる成長）
  - ・ 10兆円規模の大学ファンドの創設

#### 一人ひとりの多様な幸せと課題への挑戦を実現する教育・人材育成

##### 探究力と学び続ける姿勢を強化する教育・人材育成システムへの転換

- ・ 初等中等教育段階からのSTEAM教育やGIGAスクール構想の推進、教師の負担軽減
- ・ 大学等における多様なカリキュラムやプログラムの提供、リカレント教育を促進する環境・文化の醸成

Science, Technology and Innovation Basic Plan:

[https://www8.cao.go.jp/cstp/english/outline\\_plan.pdf](https://www8.cao.go.jp/cstp/english/outline_plan.pdf)

## Society That Japan Aims for (Society 5.0)

“**Sustainable** and **Resilient** Society That Ensures the Safety and Security of the People, and a Society in Which Each Individual Can Realize Diverse Happiness (**Well-Being**)”……**Realization of the SDGs**

Traditional Japanese values of “trust” and “sharing”

To realize such society……

“**Social Transformation utilizing Convergence of Knowledge**”  
and  
“**Investments in Knowledge and Human Resources**”

- “convergence of knowledge” that fuses the natural sciences with humanities and social science
- Development of human resources to support a new society



## The background and the objective of this project (MEXT)

Ph.D. students account for 20% of the first authors of published academic papers. They take an important role in the fields of frontier research and leading science technologies and innovations for next generation. Securing capable masters students aiming to be a Ph.D. student is essential for this country as the world is getting more competitive to retail highly skilled people.

In Japan, however, the number of Ph.D. students and doctors shows a tendency to decrease unlike other countries; acquiring Ph.D. does not attract students anymore because of the economic insecurity and the future career-paths being unclear.

Also, it has been pointed out that outstanding students no longer wish to become a researcher because of the disappointments in the environment surrounding researchers; this brings up a serious concern about a hollowing out of the future science, technology & innovation in Japan. The situation keeps to get worse with the spread of COVID-19 infections and the deterioration of the economy and the research environment. In order to resolve such a critical situation, we have to move fast to establish the countermeasure linked to the reformation of the university system; in other words, universities in our country need to change the way of providing support for Ph.D. students drastically.

Given the circumstances, it is our university's strategy to provide Ph.D. students with better treatment and support for their career-paths.





## The target research fields of each program categories

Bottom-up: a wide range of research fields including human and social sciences, expected to create innovation utilizing the strengths of the university or the local community.

**“Fellowship program to foster architects who lead super-smart society with co-creating innovative solutions to “X-Care” social issues”**

Field-specific: Quantum

**“Nambu-Einstein Fellowship Program”**

Field-specific: Materials

**“Fellowship program to foster international Ph.D. holding researchers through materials innovations”**

(Detailed explanations for each program will be provided later by the professor in charge of the field.)



- ① Objective of Fellowship Program
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The fellows passed through the selection can:

Apply for the “fellowship” (= 2,300,000yen in total per year : 500,000yen of research grant and 1,800,000yen of Research Engagement Support Fund which enables students to focus on their research)

- Research Engagement Support Fund is considered as miscellaneous income.
- As receiving Research Engagement Support Fund, the tax procedures, pension procedures, and procedures for social insurance are required.
- Research grant (up to 500,000 yen) is provided, but it needs to be properly used in accordance with the University Expenditure Rules.
- The support period is:
  - Up to 3 years for those who are enrolling in a doctoral course
  - Up to 3 years between the 2<sup>nd</sup> year and 4<sup>th</sup> year for those who are enrolling in Graduate School of Medicine and Graduate School of Life and Environmental Sciences

The support for developing a postdoctoral career-path is also provided, such as advise from the mentors and opportunities for diverse experiences.

(There are duties for the fellow students to fulfill. Also, a screening is held every year to review fellowship students’ qualifications for receiving the grant and support fund. The detailed explanations will be given later.)



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An eligible student must fulfill the conditions below:

- Those who are enrolling in the majors, which each program category designate, in April 2022 or September 2021.
- Those who possess distinguished research ability and wish to focus on research. In addition, who are willing to build their own career paths.
- Students with no experience of full-time job (\*Please confirm with Fellowship Support Office)
- Those who are under 30 years old as of April 1, 2022  
(For those who went through a life event [e.g., childbearing or childcare] are recommended to consult with Fellowship Support Office – there might be a case of making exception.)
- Those who are NOT: a fellow of JSPS Research Fellowship for Young Scientists, an international student funded by MONBUKAGAKUSHO Scholarship and an international student funded scholarship etc. by their home-country.

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Applicants are recommended to apply for JSPS Researcher Fellowship for Young Scientists (DC1) as much as possible.



## Super-smart Society Number of Acceptance: 12 people

(Fellowship program to foster architects who lead super-smart society with co-creating innovative solutions to “X-Care” social issues)

Department of Core Informatics, Graduate School of Informatics

Department of Interdisciplinary, Graduate School of Informatics

Division of Sustainable System Sciences, Graduate School of Sustainable System Sciences

Division of Electrical and Electronic Engineering, Graduate School of Engineering

Division of Physics and Electronics, Graduate School of Engineering

Division of Mechanical Engineering, Graduate School of Engineering

Division of Aerospace and Marine-System Engineering, Graduate School of Engineering

Division of Science and Engineering for Materials, Chemistry and Biology, Graduate School of Engineering

Division of Quantum and Radiation Engineering, Graduate School of Engineering

Division of Urban Engineering, Graduate School of Engineering

Department of Agricultural Biology, Graduate School of Agriculture

Department of Applied Biological Chemistry, Graduate School of Agriculture

Department of Environmental Sciences and Technology, Graduate School of Agriculture

Department of Veterinary Science, Graduate School of Veterinary Science

Division of Rehabilitation Science, Graduate School of Rehabilitation Science

Department of Nursing, Graduate School of Nursing

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## Super-smart Society Number of Acceptance: 12 people

(Fellowship program to foster architects who lead super-smart society with co-creating innovative solutions to “X-Care” social issues)

Department of Mathematics, Graduate School of Science

Department of Physics, Graduate School of Science

Department of Chemistry, Graduate School of Science

Department of Biology, Graduate School of Science

Department of Geosciences, Graduate School of Science

Department of Biological Chemistry, Graduate School of Science

Department of Economics, Graduate School of Economics

Department of Global Business, Graduate School of Business

Department of Law and Political Science, Graduate School of Law

Department of Human Behavioral Sciences, Graduate School of Literature and Human Sciences

Department of Cultural Management, Graduate School of Literature and Human Sciences

Department of Language and Culture, Graduate School of Literature and Human Sciences

Department of Philosophy and History, Graduate School of Literature and Human Sciences

Department of Urban Management, Graduate School of Urban Management

Department of Basic Medical Science, Graduate School of Medicine

Department of Clinical Medical Science, Graduate School of Medicine

Division of Human Life and Ecology, Graduate School of Human Life and Ecology



**Quantum** Number of Acceptance: 10 people  
(Nambu-Einstein Fellowship Program)

Department of Mathematics, Graduate School of Science  
Department of Physics, Graduate School of Science  
Department of Chemistry, Graduate School of Science  
Department of Biology, Graduate School of Science  
Department of Geosciences, Graduate School of Science  
Department of Biological Chemistry, Graduate School of Science

Division of Physics and Electronics, Graduate School of Engineering  
Division of Science and Engineering for Materials, Chemistry and Biology,  
Graduate School of Engineering

Department of Core Informatics, Graduate School of Informatics





**Materials** Number of Acceptance: 15 people  
(Fellowship program to foster international Ph.D. holding researchers through materials innovations)

Division of Science and Engineering for Materials, Chemistry and Biology, Graduate School of Engineering

Division of Physics and Electronics, Graduate School of Engineering

Division of Electrical and Electronic Engineering, Graduate School of Engineering

Division of Mechanical Engineering, Graduate School of Engineering

Department of Chemistry, Graduate School of Science

Department of Physics, Graduate School of Science

Department of Biology, Graduate School of Science

Department of Biological Chemistry, Graduate School of Science

Department of Applied Biological Chemistry, Graduate School of Agriculture

Department of Agricultural Biology, Graduate School of Agriculture

Department of Basic Medical Science, Graduate School of Medicine



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## Schedule (subject to change)

- Selections in all program categories take place in early-March, 2022
- The result will be notified in mid-March or late-March
- It is allowed to apply for up to 2 programs at the same time
- The application guidelines will be open in December

(Selection schedule for those who enroll in April 2023 is not arranged yet)

## Examinations (Selection process)

- Essay
- Interview (Presentation and Q&A)

