

Institute of Space Technology

**National Center of GIS and Space Applications (NCGSA)**



**Research Fund**

**Proposal Guidelines**

# Background

National Center of GIS and Space Applications (NCGSA); a project of Higher Education Commission (HEC) of Pakistan led by Institute of Space Technology is a consortium of seven research laboratories in seven higher education institutions of Pakistan. NCGSA is one of the five national centers being established under the project of “Establishment of National Centers for Research and Innovation in the Emerging Disciplines of Science and Technology” by HEC and Government of Pakistan.

NCGSA encompasses endeavors that strive to achieve and sustain human, technological, research and entrepreneurial capacity in the areas of space science, technology and its applications for the socio-economic development of Pakistan. NCGSA Research Fund is in alike continuance of such efforts and is designed to synergize the research efforts & contributions of researchers of the country.

The fund will focus research projects in the field of Space Science, Technology and Applications, particularly the Geographic Information Science (GIS) from the faculty members & researchers of HEIs and R&D Organizations. This funding opportunity aims at fostering the transition of research into the domains of integration and business. The successful outcome of this fund is envisioned to be a combination of market oriented technological research and socio-economic uplift of the country through modern solutions.

# Research Areas

Proposals are invited in in all domains of space science, technology and its applications, with a special focus on GIS and Space Applications. However, following areas are prioritized by the Scientific Committee of the NCGSA keeping in view the current socio-economic challenges of the country. It is pertinent to mention here that, relevance of the proposed research to these areas will be a key factor for the award of funding.

* 1. **Remote Sensing & Geographic Information Science**
     1. Remote Sensing Systems and its Applications
     2. Earth Observation, Atmosphere, Environment and Climate
     3. Geospatial System Development
     4. Urban and Regional Planning
     5. Water Resource Dynamics
     6. Natural Resource Inventory and Management
     7. Natural Hazards and Disaster Mitigation
     8. Space for Health and Safety
     9. Space for Agriculture, Forests & Food
     10. Earthquake and Seismic Monitoring & Mapping
     11. Smart and Safe Cities
     12. Alternate Energy Resources
     13. Space for United Nation’s Sustainable Development Goals (SDGs)
     14. Any multidisciplinary project involving or imparting the confluence of advanced knowledge i.e., Artificial Intelligence, Cyber Security, Robotics & automation and cloud computing and big data, smart agriculture, etc.
  2. **Small Satellite Technology**
     1. Small Satellites Technology and Applications
     2. Satellite Constellations Design and Applications
     3. Space Based Instruments & Sensors
     4. Indigenous Technology Development for Satellite Sub Systems
  3. **Positioning, Navigation & Timing**
     1. Autonomous Control and Unmanned Systems
     2. Location Based Services and Applications
     3. Software and Hardware Global Navigation Satellite Systems (GNSS) Receivers
     4. Interference and Spoofing Technologies and Countermeasures
     5. NAV-COM Integration and Positioning
     6. GNSS Timing Applications
     7. GNSS Based Internet of Things (IoT) and Augmented & Virtual Reality
     8. Ionosphere and Seismic Monitoring using GNSS
     9. Space Weather and GNSS
     10. Smart and Precision Agriculture
     11. Transportation Applications (Road, Rail, Air, Marine, Space)
  4. **Astronomy, Astrophysics & Astrobiology**
     1. Astronomy & Astrophysics
     2. Plasma & Solar Physics
     3. Microgravity Science and Applications
     4. Astrobiology & Its Applications
  5. **Space Popularization & Outreach**
     1. Space Education, Awareness and Popularization
     2. STEAM (Science, Technology, Engineering, Arts & Mathematics) for Space
     3. Space Applications for Tourism and Recreation
  6. **Space Applications & Advanced Systems**
     1. Big Data Analytics & Cloud Computing for Space
     2. Artificial Intelligence, Machine Learning & Deep Learning
     3. Space Robotics and Mobility Systems
     4. Intelligent Transportation Systems (Road, Rail, Air, Marine, Space)

**Important Note:** Research proposals should not have significant overlap with the application domains of NCGSA and with the outputs committed through the affiliated labs of NCGSA. Details of the labs and their outputs are available on *ncgsa.org.pk.*

# Eligibility

Research proposals are invited from the faculty members & researchers of Higher Education Institutions and Research & Development organizations of Pakistan. Lead applicant / Principal Investigator (PI) should be a full-time faculty member / employee of a Higher Education Institution or R&D organization based in Pakistan. The proposal shall have the support of affiliated organization i.e., Principal Investigator’s Organization (PIO).

The proposals shall be academia-industry joint research projects, preference will be given to the proposals having the Principal Investigator (PI) from academia, having strong collaboration with public / private industry or R&D organizations. Co-Principal Investigator could be from HEIs / R&D organization / local commercial industry.

The research proposals should focus on sustainable socio-economic development of Pakistan through Space Science, Technology and its Applications.

# Academia-Industry Collaboration

The proposals shall be academia-industry joint projects leading towards prototype / products / process / hardware or software solutions or models and maps etc. The proposals should address the current socioeconomic issues or identify opportunities, which are marketable, leading to positive cash-flows with the help of local industry.

Public and private industries and R&D organizations are encouraged to join resources with academia for the solution of local issues, upscaling / modernizing the processes, development of prototypes and solutions on a successful business model.

The proposals should have a clear aspect of linkage development with business community at local and international levels. Project team should clearly identify, how their collaboration will develop partnerships beyond the partnering organizations and with active industrial sector related to the proposed research.

# Duration and value of Award

* 1. **Duration:** Maximum up to 24 Months (Two Years)
  2. **Value of Fund:** Maximum up to 15 Million PKR per project
  3. **Academia-Industry Partnership:** The proposals shall be academia-industry joint projects leading towards sustainable socio-economic growth. Preference will be given to the proposals having the partner industry / R&D organization contributing in cash or kind.

# Application Process

Proposals shall be submitted on the standard NCGSA Research Fund Proposal Forms available on the NCGSA website *(ncgsa.org.pk)*. The forms can be downloaded from the link:

*https://ncgsa.org.pk/ncgsa-research-fund/*

**List of forms**

1. Research Fund Proposal Form (NCGSA-RF-F-01/00)
2. Budget Form (NCGSA-RF-F-02/00)
3. PI & PIO Information Form (NCGSA-RF-F-03/00)
4. Target Outputs Form (NCGSA-RF-F-04/00)

Duly filled forms along with all attachments shall reach NCGSA Secretariat by **April 23, 2021** through all of the following mediums:

* 1. **Hard Copy:** Original signed forms and attachments with 2x copies (tape / spiral bind) on the address: NCGSA Secretariat, Institute of Space Technology, 1, Islamabad Highway, Islamabad, Pakistan.
  2. **Online Submission:** Soft copy of signed & stamped documents with all attachments to be submitted online on: https://ncgsa.org.pk/ncgsa-research-fund/. (Merged PDF Files – Allied Document to be attached with Research Fund Proposal)
  3. **Email Submission:** Email soft copy of signed & stamped documents with all attachments on: researchfund@ncgsa.org.pk & ncgsa@ist.edu.pk. The email must have the subject in the format: NCGSA Research Fund - PIs Name - PIOs Name. (Editable Files: Word and Excel Files - PDF only of scanned attachments)

# Evaluation Process

A three-stage evaluation process is will adopted for the evaluation and award of the research fund, as described below:

* 1. **Stage – 1 (Initial Scrutiny):** An Evaluation Board comprising representatives of NCGSA, HEC and Industry will initially scrutinize the proposals. This board will shortlist proposals on the basis of relevance to the defined Research Areas (as detailed in section 2), credentials of PI, PIO and Industrial Partner will be evaluated at this stage. Incomplete and irrelevant proposals will be rejected at this stage.
  2. **Stage – 2 (Detailed Review):** The shortlisted proposals along with the credentials of industrial partner will reviewed by national and international subject matter experts and renowned scientists.
  3. **Stage – 3 (Presentations):** Top ranked reviewed proposals will be required to give a presentation to a larger panel comprised of stage – 2 reviewers, Evaluation Board and Members of NCGSA National Steering Committee. This presentation will be a final pitch followed by a discussion session. At this stage final decision shall be made for the award of fund.

# Certification from Principal Investigator

Principal Investigator (PI) of the research proposal shall certify that:

* 1. The PI is a full-time faculty member / employee of a Higher Education Institution / R&D organizations based in Pakistan.
  2. The equipment(s) demanded for the subject research is / are not already available at Principal Investigator’s Organization (PIO).
  3. The project under reference is not under consideration at any other funding agency including HEC.
  4. This research / portion of research has not been previously funded by any other funding agency including HEC.
  5. The subject research is genuinely novel and there is no plagiarized material including self-plagiarism.

# After Award Formalities

* 1. **Monitoring:** Each project will be monitored completely over the course of the project timeline and can be called to pitch the progress or product showcasing (if applicable). Monitoring reviews can be done as and when required during the project duration.
  2. **Reporting:** Principal Investigator shall be required to submit biannual (Six Monthly) progress reports, however quarterly / monthly reports can be asked as and when required by the NCGSA Secretariat. A comprehensive report at the closure of the project will also be taken from the PI.
  3. **Data Privacy:** NCGSA is development project funded through PSDP, hence all information submitted through the proposal forms by PIs, and obtained during the project life cycle can be made public, as and when required. There will be no liability of data privacy on NCGSA Secretariat.