JOINT CALL FOR CONSORTIA PROPOSALS

to establish a

2D Material Research Fab and Innovation Hub (2D Innovation Hub)

by

अनुसंधान नेशनल रिसर्च फाउंडेशन
Anusandhan National Research Foundation

Anusandhan National Research Foundation

Under

Innovation Hub for Advancement in High-impact Areas (MAHA)

and

सत्यमेव जयते
Ministry of Electronics & Information Technology
Government of India

Ministry Of Electronics and Information Technology

Under

R& D in IT, Electronics, CC &BT

INDEX

1. Background
2. Aim and Objectives of 2D Innovation Hub
3. Focus areas under 2D Innovation Hub
4. Duration and Eligibility Criteria
5. Guidelines for drafting Proposal
6. Expected Deliverables
7. Major activities of 2D Innovation Hub
8. Funding Mechanism
9. Roles & Responsibilities Of 2D Innovation Hub
10. General Conditions/ Guidelines
11. Evaluation and Mode of Selection
12. Mode of Submission of Innovation Hub of Proposal

2D Material Research Fab and Innovation Hub : Joint Call for consortia Proposals

1. Background

1.1 Anusandhan National Research Foundation (ANRF)

ANRF, a statutory body of the Government of India, has been established to provide high level strategic direction for research, innovation and entrepreneurship in fields of natural sciences and scientific and technological interfaces of humanities & social sciences to promote, monitor and provide support as required as per recommendations of the National Education Policy.

Mission for Advancement in High-impact Areas (MAHA) is a program under ANRF to support priority-centric, solution-based research in Mission mode focussing at some key areas in alignment with nation's prime requirements. It is envisaged to be multi-disciplinary, multi-institutional and multi-investigator projects with industrial partnerships in the best sorted areas of immediate concern.

1.2 Ministry of Electronics and Information Technology (MeitY)

The Ministry of Electronics and Information Technology (MeitY), a central ministry of the Government of India, is a stand-alone ministerial agency, responsible for formulating and implementing national policies and programs aimed at enabling the continuous development of the electronics and IT industry. MeitY focuses on human resource development and promotes R&D and innovation in electronics and IT with a strong emphasis on emerging sectors.

R&D Scheme at MeitY supports academia, R&D organizations, start-ups/ MSMEs, and domestic companies & multinationals; with a long-term roadmap to push the boundaries of current knowledge to create new innovations, solutions, know-how of

various processes technologies, IPs, Systems and products and ensure advancements to benefit societies, industries, and economies at large.

1.3 Announcement for 2D Material Research Fab and Innovation Hub (2D Innovation Hub)

Advanced Materials has been identified as a key area under ANRF and MeitY, to be engineered for specific, high-impact applications. ANRF has approved the initiative of starting a mission with a program on "2D Material Research Fab and Innovation Hub" under the priority areas of Advanced Materials under MAHA in collaboration with Ministry of Electronics and Information Technology (MeitY). Now, ANRF and MeitY have announced the Call for proposals for establishing the "2D Material Research Fab and Innovation Hub (2D Innovation Hub)".

Under the call, proposals are invited from Government/Private academic institutions/R&D organisations in consortium mode to establish one 2D Material Research Fab and Innovation Hub (2D Innovation Hub) in Hub and Spoke model. The hub is to be operated as a Section-8 Company preferably hosted in an Academic institutions/R&D organization (will be referred to as Implementing Agency (IA) from here onwards). Financial contribution from Industry is mandatory.

The proposals should demonstrate the interdisciplinary 2D materials-based innovations with a clear pathway towards establishment of R&D Ecosystem to enable translation, commercialization and deployment of technologies for nations need.

1.4. Hub & Spoke Model

Under 2D Innovation Hub, an ecosystem needs to be established for scientific and technological innovation, and product development.
To accomplish this, a "Hub and Spoke" model need to be adopted under 2D Material Research Fab and Innovation Hub.

Hub: The hub under the proposal is to be set up at any Government/Private academic institutions/R&D organisations which needs to serve as the nodal centre for scientific and technological innovation, coordinating research, product development, and

strategic initiatives across spoke institutions. The spokes/spikes will be linked with Hub to avail facilities, and offer expert support for fostering collaboration, knowledge sharing, and alignment with national priorities. The Hub will have provision for providing financial support for carrying out translational research to ensure that cutting-edge ideas translate into impactful solutions at the Spokes/Spikes level.

Spokes: Spokes are defined as the partnering Government/Private academic institutions/ R&D organisations that collaborate with the hub on specific research based on their areas of expertise. Spokes are to be benefitted from the hub's resources and guidance.

Spikes: The academic institutions/ R&D organisations associating with the spokes/hub working for the directed research will be referred to as “spikes” and they can be identified through open call/ grand challenge.

2. Aim and Objectives of 2D Innovation Hub

2.1 Aim

To foster and nurture scientific and industrial R&D in 2D materials-based technologies, establishing an innovative ecosystem in India that drives research and development, commercialization and deployment of indigenous technologies for various application/sectors.

2.2 Objectives

- To establish an ecosystem to carry out R&D in 2D materials-based technologies for electronics applications.
- To design and develop indigenous 2D materials-based technologies/ prototypes/devices/components/products/sub-systems/systems for a wide range of applications.
- Capacity building and IP generation.
- To support startups and foster entrepreneurship by providing mentorship, incubation, and access.

- To propose a governance structure and a strategy to make the hub self-sustainable.

3. Focus Areas under 2D Innovation Hub

The proposals may focus on at least 2 out of the following sectors identified below (for the development of electronic devices/ products/systems), (other areas may be proposed with justification):

(i) Sensors for various sectors
(ii) Electronics and Optoelectronics devices (such as LEDs, photodetectors,)
(iii) Memory devices
(iv) Neuromorphic technologies, and 2D memristor devices
(v) Quantum technologies
(vi) Co-integration with established technologies such as CMOS, FinFET, etc.
(vii) Challenges specific to Strategic Sector (EMI Shield, Flexible Electronics, etc.)

4. Duration and Eligibility Criteria

4.1 Duration

The duration of the project may be maximum up-to 5 years based on the complexity and nature of the project. However, a further plan for sustainability of the hub/deployment of the developed technologies need to be included.

4.2 Eligibility Criteria

4.2.1. For Academia/R&D organizations

(i) Applicants [Lead Principal Investigator (LPI) and Principal Investigator(s) (PI(s))] should be Indian citizens. Foreign nationals (including OCI and NRI) are also eligible to apply provided they fulfil the eligibility criteria by ANRF.

(ii) The applicant(s) must hold a regular academic/research position in a recognized Government/Private academic institution/national laboratory/ any other recognized R&D institution in India with proven track record in the relevant domain.

(iii) Private academic institutions with valid UGC/AICTE/PCI approval, Private R&D organisations with valid DSIR-SIRO recognition and voluntary and non-governmental organizations registered under NITI-AAYOG Darpan portal are only eligible.

(iv) LPI and PI(s) should have at least 5 years of service remaining at the time of submission of the proposal.

(v) Proposals involving multiple institutions with some prior R&D infrastructure and expertise in the relevant domain will be given preference.

(vi) pre-identified site for establishing a single location 2D Innovation Hub need to be proposed.

4.2.2. Criteria for industry participating as funding agency

i. Companies/LLPs engaged/interested in R&D including startups (as per the DPIIT notification dated 19th February 2019 or extant norms), MSMEs (as per the Gazette Notification by Ministry of Micro, Small and Medium Enterprises, dated 1st June 2020 or extant norms) and Indian companies/ LLP which are incorporated in India under the Companies Act, 2013/ the Limited Liability Act, 2008 and the Companies/ LLPs having foreign investment in strict compliance with the Consolidated FDI Policy of 2020 or extant norms is eligible to partner with IA as a funding agency.

4.3 IPR Ownership:

The intellectual property rights (IPR) of the technologies developed will remain with the IAs, while the funding industry will hold the first right of refusal.

5. Guidelines for drafting Proposal

Proposals involving multiple institutions with some prior R&D infrastructure and expertise in the relevant domain will be given preference.
The proposals should have a concise concept note and detailed full-proposal with following features:

- A pre-identified site for establishing a single 2D Innovation Hub need to be proposed.
- Plan for Registration of Section 8 company under the Companies Act, 2013 for R&D ecosystem establishment and the modalities of functioning of the hub as a section 8 company need to be included.
- Defined objectives and Outcomes
- Quantifiable deliverables with pre-defined timelines.
- Key Performance Indicators (KPIs) such as number of prototypes, patents, Technologies, ToTs, products, systems, start-ups to be supported and incubated, manpower to be trained, etc.
- The present Technology Readiness Level (TRL) level and targeted TRL level mapped with the timeline and intermediate deliverables. (See Annexure I)
- Proposals submitted must be original in ideation and content. Applicants are requested to pre-check their proposals for plagiarism before uploading. Plagiarism in any form will not be acceptable. All submitted proposals would be subjected to a third-party similarity check and proposals are liable to be rejected if found plagiarized. Any text taken verbatim from other source needs to be identified using quotation marks and proper reference. Plagiarism report needs to be uploaded.
- Modality for outreach, and generation of skilled manpower at various levels
- Identified areas for R&D. At least two needs to be identified (refer Section 3).
- Number of Translational Research projects to be carried out in the hub
- No. of Spokes (at least 7 spokes to be supported by the Hub)
- No. of R&D projects through spikes
- Details of existing infrastructure at the IA
- Commercialization and self-sustainability strategy for the hub
- Capital expenditure plan. It should be in a phased manner over the project duration, and procurement of all equipment in the first year will not be

preferred and it should be staggered throughout the product duration depending upon the critical requirements of various equipment.

- Facilities available elsewhere in the country may be leveraged to the maximum possible extent and their association brought out in the proposal.
- It should include a governance structure and a sustainability plan for the post-projects period.
- Strong emphasis on:
  - ❑ Scalability and Production
  - ❑ Startup Engagement
  - ❑ User requirement and commitment
  - ❑ Production agency tie-up
  - ❑ Letter of agreement with the partnering industry/users/others need to be provided within one month of the proposal submission.

6. Expected Deliverables of the Proposal

The proposal may clearly define year wise deliverables **(Key Performance Indicators (KPI))** (Patents, Technologies, Prototypes, Transfer of Technologies (ToTs), Devices, Start-up incubation, etc.) with commercialization strategy.
The proposal should include:

- At least 2 market ready products (Purely software-based products will not be considered as per user requirement by the end of project. The complete value chain for the identified products/technology (design, development, testing, packaging etc.)
- Tangible technologies with high TRL >7
- Number of good quality IPs (not less than 10 IPs) (The IPR norms will be as per ANRF and MeitY)
- No of ToTs (not less than 5 ToTs)
- Total number of startups
  - to be incubated (minimum 3)
  - to be mentored (minimum 10 startup)

    - that can access the facilities in reasonable & transparent manner
- Short-term, mid-term and long-term milestones and deliverables
- Plan for technology exploitation and market readiness
- Skilled Manpower

7. Major Activities Of 2D Innovation Hub

The five broad major activities to be carried out by the 2D Innovation Hub are as follows:

7.1 2D Materials based technology and prototype development

i. *Translational R&D:* R&D within the interdisciplinary field of 2D Materials Science leading towards commercially viable products addressing fundamental issues. The LPI of the group will be responsible for the synergistic integration of the technologies developed and demonstrated by all the PIs and industry/others. It is essential to ensure that each band of TRLs (4-6 for applied/early translational and 7-9 for translational) is to be taken care of without confusing objectives across themselves. It also seeks to promote the generation of patents, IPs and rapid commercialization of the technologies with TRL levels 7-9.

ii. *Directed Research:* Under this component, a dedicated group of Scientists/Researchers, in collaboration with several other national academic and research institutions of excellence and Industry, will carry out major research programs specifically designed to meet the requirements of line Ministries, Departments, Agencies and Industry.

iii. *R&D Infrastructure Development:* Developing such R&D infrastructure is a major focus of the Innovation Hub. Developing a well-structured plan and appropriate mechanisms for setting up the state-of-the-art facilities for synthesis, characterization, testing, calibration, etc., for 2D materials-based research that can be accessed by researchers across the country.

7.2 Generation of Skilled Manpower

This component of the Innovation Hub aims to provide the state-of-the-art training for the generation of skilled manpower in the domain at various levels including next-generation scientists, engineers, technocrats, entrepreneurs, etc.

7.3. International Collaborations

Collaboration with International agencies with similar interests may be explored.

7.4. Outreach and Professional Development

2D Innovation Hub should launch stimulating interdisciplinary education programs (summer school, winter school, workshops, hands-on trainings, seminar, etc.) in 2D materials research and engineering field for PhD, postdoctoral students and young faculties. Special initiative can be taken for enhancing support for under-represented groups in the society to increase scientific literacy.

7.5. Startup Support

2D Innovation Hub aims to foster and develop an entrepreneurial ecosystem by supporting deep-tech start-ups, incubating new start-ups and facilitating industry collaboration.

8 Funding Mechanism

The following budget mechanism is proposed for the proposals:

a) If the Total proposed budget is less than Rs.525 crore: ANRF and MeitY will contribute 2/3rd of the total outlay and participating Industry/Users/Others is supposed to provide the rest 1/3rd (in-cash (preferred) or in-kind)

b) If the Total proposed budget is Rs.525 crore or more than Rs.525 crore: Additional funding requirement may be sought from the

Industry/Users/Others or any other stake holders.

c) If the cost of land, civil construction and clean room are included, it will be considered as maximum **5%** of the total budget or in actuals, whichever is less.

d) Maximum of Rs. 5 crore should be provisioned for each identified spoke.

e) Funding may be proposed for the PIs participating from other institutions (excluding capital head).

9 Roles & Responsibilities Of 2D Innovation Hub and Spokes

Only one hub is to be supported under the Call with multiple Spokes and Spikes. The roles and responsibilities are as follows

9.1. Roles and responsibilities of the Hub

9.1.1. Establishment of R&D ecosystem as a section-8 company to be accessed by academia and industry for translational R&D

9.1.2. Registration of the Section-8 company under the Companies Act, 2013.

9.1.3. Constitution of Advisory committee/ Governance structure for the section 8 company and Review committee for execution of Innovation Hub activities.

9.1.4. Identification of spokes and engagement with the spokes with respect to technical and financial monitoring.

9.1.5. Hub will be responsible to deliver the tangible outcomes committed under the proposal in terms of KPIs.

9.1.6. Generation of skilled manpower through exchange programmes, training workshops, seminars, hands-on-training, etc.

9.1.7. Startup incubation and startup support

9.1.8. Development and launch of a national web-portal for 2D Innovation Hub.

9.1.9. Conduct grand-challenges/Hackathons

9.1.10. Benchmarking, develop market ready product, market-outreach for the proposed technologies.

9.1.11. Identify a governance structure and a sustainability plan for the post-project period.

9.2. Roles and responsibilities of the Spoke /Spike

9.2.1. To carry out R&D by engaging with Hub as per the proposed innovation outcomes.

9.2.2. Each identified Spoke may focus on one specific material/technology.

9.2.3. Generation of skilled manpower through exchange programmes, training workshops, seminars, hands-on-training, etc.

9.3. Industry partner(s) will be responsible for the following activities:

9.3.1. Handhold/Co-develop the solution in collaboration with the Hub/Spokes/Spikes

9.3.2. Provide a test bed for field trials/clinical trials if available

9.3.3. Conduct market study

9.3.4. Provide the requirement/ specifications for any identified technology/solution based on 2D materials.

9.3.5. To carry forward the technology know how by setting up the pilot production/manufacturing line.

10 General Conditions and Guidelines

a) Project proposals with multiple PIs and multiple academic institutions/R&D organizations are invited in consortium mode.

b) 2D Innovation Hub is required to be led by experts with proven track record in related areas and working in regular positions in recognized academic institutions, public funded R&D organization, etc. The LPI should identify the Innovation Hub partners (from same institution and other partnering institutions), their roles and responsibilities and work towards the project

targets/objectives for the successful completion. Post selection of the project, funds will be allocated to LPI or nodal implementing agency which will in turn be distributed to other academic/ R&D lab partners. Industry is not eligible to submit proposals as LPI.

c) Participation of relevant industries/PSUs/start-ups is mandatory with matching contribution (preferrable in cash). The industry partner is expected to provide funding in cash (preferred) or in-kind (in the way of extending R&D facilities, providing test beds or systems for testing and validation, etc.) towards the successful execution of the project. funding modalities in case of industry submitting proposal is not mention.

d) In 2D Innovation Hub, a minimum of 3 PIs shall be involved from the same institution with clearly defined roles and responsibilities and time with proper justification. The fund will be transferred to the Hub only. Funding may be proposed for the PIs participating from other institutions (excluding capital head).

e) The research grant is provided to the Hub under the capital head of ANRF and under the GIA head of MeitY for equipment including software, license fees and warranty charges, plant cost/fabrication systems/demonstration models; and under general head for research personnel, consumables, travel, contingency and other cost (user charges/outsource work, etc.). The "Overhead" will be as per the ANRF-OM dated Oct 14, 2024. No budget provision for Capital for the proposals submitted by Spokes. In case of specific requirement, budget under capital may be considered and approved by the competent authority subject to the justification provided.

f) Priority will be given to research proposals that lead to the development of technologies and products capable of commercialization at the industry level. Clear pathways to global IP generation and technology transfer should be provided.

g) ANRF and MeitY may suggest restructuring the proposals and reorganization of members of the consortia based on the nature of area of work, merits and technology requirements. Accordingly, it may be requested to submit revised project proposal.

h) An expert committee needs to be constituted for the monitoring and smooth functioning of the 2D Innovation Hub with one representative from ANRF and MeitY each.

i) The IPR sharing for hub, spokes, spikes and participating industry needs to be clearly defined. The non-exclusive right to the industry partner will be preferred. However, the first right of refusal may be kept with industry partner.

j) Commercial exploitation of the IP created, conceived or developed under the project shall be done in a manner such that the associated revenue/ profits and/ or royalty are received by the approved applicant in India and are subject to tax in India, in compliance with applicable laws in India.

k) Exclusionary clause: The approved applicants that receive incentives, benefits or support under the scheme shall retain ownership of the Intellectual Property ("IP") created, conceived or developed under the project

l) "Intellectual Property Rights" for the purpose of this Scheme means any copyright and related rights, patents, rights to inventions, registered designs, database rights, design rights, topography rights, trademarks, service marks, trade names and domain names, trade secrets, rights in unpatented know-how, rights of confidence and any other intellectual or industrial property rights of any nature including all applications (or rights to apply) for, and renewals or extensions of such rights and all similar or equivalent rights or forms of protection which subsist or will subsist now or in the future in any part of the world.

m) The proposal focus should be on the development of electronic devices/ products/systems.

n) Memorandum of Association (MoA) from the industry/User/others needs to be submitted along with the proposal.

o) One or more industries can contribute to the project provided each company is expected to be engaged in at least one R&D project.

Note: It is strongly recommended that the LPI identify the industry and secure their commitment in principle before submitting the proposal. It is desirable that broad framework of active collaborations among consortia members be included in the proposal. The PI should focus on more industry-oriented problems, as the ultimate goal of the R&D project is to develop technology or devices for the industry that may further be used in the country. The PIs must be specific about the deliverables and targets of the proposal and categorically mention the industry's scientific role in achieving the objectives.

11 Evaluation and Mode of Selection

11.1 Evaluation

A joint expert group called as Innovation Hub Advisory Committee (IHAC) constituted by ANRF and MeitY would consider the proposals for feasibility and carry out technical and financial evaluations for the recommendation for financial support.

- Selection will be based on:
    i. Scientific and technical merit of the LPIs and PIs.
    ii. Capability of the Academic Institute/R&D organisation, including existing infrastructure and prior work in the area.
    iii. Innovation potential
    iv. Commercialization prospects
    v. Role of Industry/ Start-up
    vi. Alignment with national priorities
    vii. Sustainability plan beyond the project tenure

A concise concept note (as per a prescribed format) should be submitted in addition to the full proposal (along with all requisite documents) before the deadline. The proposals will be reviewed at two levels, namely, Level A and Level B.

a) Level A: Concept notes will be screened at this stage and only the full proposals of the short-listed Concept notes will be reviewed further.
b) Level B: The shortlisted full proposals will be subjected to rigorous assessment with the help of subject matter experts. If required, the LPI and PIs of the full proposals that clear the review process, may be invited for a discussion/presentation.

IHAC will recommend the proposals, and the Executive Committee (EC) of ANRF and MeitY will give the final approval.

12. Mode of Submission of Proposal

a) LPI is eligible to apply for only one proposal during a call.
b) Only one proposal to be submitted from one implementing agency as LPI.

c) The Call for applications will be notified through the "online portal" of ANRF website "www.anrfonline.in".

d) The proposals under 2D Innovation Hub should be submitted only through online portal of ANRF. The proposals submitted in any other mode/platform will not be considered by ANRF.

12 .1 Guidelines for Online Application Submission

For successful online submission of the application, the following points may be noted:

a) LPI and PI(s) should first register on official website click here to register.

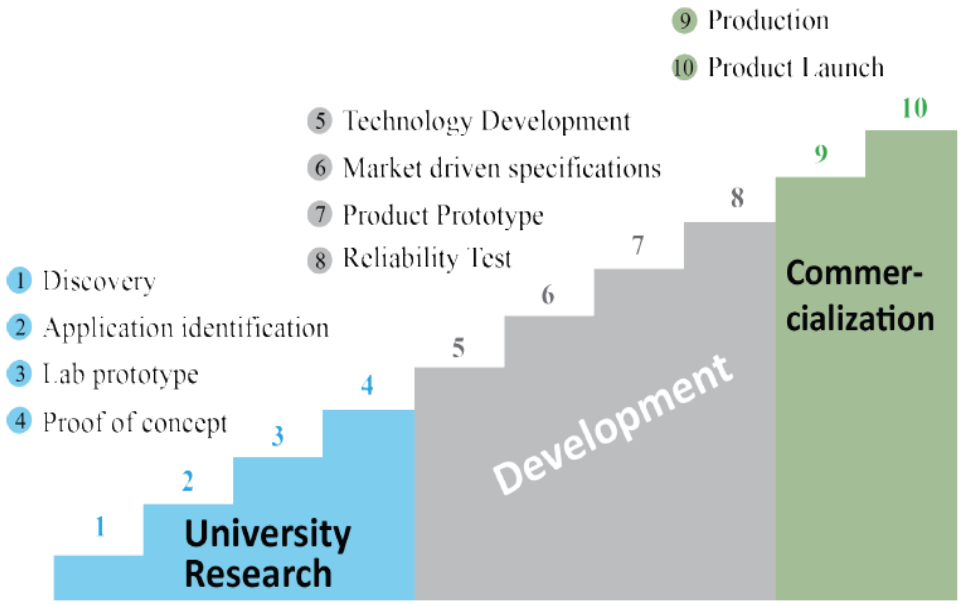
b) After log-in, applicant(s) are required to fill all the mandatory fields in Profile Detail section 22.

c) Some of the key elements of the proposal should be defined clearly such as Project Title (max 500 characters), Project summary (max 3000 characters), Keywords (max 6), Objectives of project (max 1500 characters), Target values being set for the Projects, Expected output and outcome of the proposal (max 1500 characters)

d) Other Technical Details (OTD) of the proposal has to be uploaded as a single file in PDF format.

Annexure I

Reference for TRL levels used in R&D



FAQs – 2D Material Research Fab and Innovation Hub (2D Innovation Hub)

1. **What is the 2D Innovation Hub?**

   The 2D Innovation Hub is a national initiative by ANRF and MeitY to build an R&D ecosystem focused on 2D materials, enabling indigenous development, commercialization, and deployment of advanced electronics-based solutions.

2. **What is the aim of the 2D Innovation Hub?**

   To strengthen India's capability in 2D material science through collaborative R&D, infrastructure development, IP creation, startup support, and long-term sustainability.

3. **How many Hubs can be proposed under this initiative?**

   Only one 2D Innovation Hub shall be established in consortia mode.

4. **What is the structure of the 2D Innovation Hub formation?**

   It follows a **Hub and Spoke** model:

   i. **Hub**: Central coordinating body
   ii. **Spokes**: Partner institutions conducting R&D
   iii. **Spikes**: Short-term focused research groups engaged via open calls

   However, ANRF and MeitY have the right to restructure the proposed Model of the Hub/Spoke by merging/removing institutes/organisations at the approval stage

5. **What is the Hub and Spoke Model?**

   Hub: The hub, to be established at any Government/Private academic institution/R&D organisation, needs to serve as the nodal centre for scientific and technological innovation, coordinating research, product development, and strategic initiatives across spoke institutions.

   Spokes: Spokes are defined as the partnering Government/Private academic institutions/ R&D organisations that collaborate with the hub on specific research based on their areas of expertise. Spokes are to be benefitted from the hub's resources and guidance.

   Spikes: The academic institutions/R&D organisations associating with the spokes/hub working for the directed research will be referred to as "spikes" and they can be identified through open call/ grand challenge.

   The spokes/spikes will be linked with Hub to avail facilities, and expert support for fostering collaboration, knowledge sharing, and alignment with national priorities.

6. **What is the legal structure of the Hub?**
   It must be established as a Section-8 Company under Companies Act, 2013, preferably hosted in an academic institution/ R&D organisation. The Hub will receive the funding through the academic institution/ R&D organisation to which the LPI is affiliated to.

7. **Where is the Hub to be established?**

   The Hub is to be established on the premises of the Lead Principal Investigator's (LPI's) institute or any identified location leveraging the facilities/resources at the LPI's and Principal Investigator's (PI's) Institute.

8. **What is the role of the Hub?**

   Hub is responsible for the overall progress of the project - technical and financial. Some of the responsibilities are:

   i. Creation of Ecosystem for 2D research
   ii. Coordinated research with spokes/spikes
   iii. Disburse funds to spoke
   iv. Generate skilled manpower
   v. Deliver KPIs

9. **Whether Hub or spoke should have prior experience in translation research under this project.**

   Yes, it is mandatory for PI to have research experience in translational research in the proposed domain.

10. **Who can apply as a Lead Principal Investigator (LPI)? Can the LPI be modified at an intermediate or later stage?**

    LPI must be an Indian citizen in a regular academic or R&D position. Foreign nationals (including OCI and NRI) are eligible if they meet ANRF eligibility criteria.
    No, LPI will not be changed in normal situations. Only in unforeseen situations with the approval of the governing body, it may be considered.
    In the absence of the LPI, a PI from the same institute may be considered by the approval of the funding agencies.

11. **Can LPI be from an R&D organization?**

    Yes, both academic and R&D organizations are eligible to lead the Hub.

12. **Can an LPI or institute apply for more than one Hub?**

    No, LPI or institute can submit only one proposal during this call.

13. **How many PIs can be included from the same institution?**

    Minimum three experts needs to be included as PI.

14. **Is there any limit of PIs from the institute that proposes to establish hub?**

    There is no limit to number of PIs from the institute.

15. **Do PIs from other institutions under the Hub get funding?**

    Funding may be proposed for the PIs participating from other institutions (excluding capital head).

16. What is the difference between a PI from the Hub and PI from the Spoke?

PI from the Hub will get funding (without ant any capping) without any capital. However, a PI from the Spoke will get funding with a Capping of five crores including capital.

17. Can the LPI/PI be Foreign Nationals?

Yes, Foreign nationals (including OCI and NRI) are eligible to apply provided they fulfil the eligibility criteria notified by ANRF.

18. How many Investigators are required to submit proposal to hub to be a Spoke?

Minimum three investigators are required to establish a Spoke.

19. What are the responsibilities of Spokes and Spikes?

Spokes conduct R&D in specific domains and Spikes undertake targeted research through open calls as per decisions of Hub.

20. Will spoke receive any funds?

Yes, maximum of Rs. 5 crores may be provisioned for each identified spoke to carry out R&D work.

21. Will spike receive any funds?

Spikes will be identified through an open call or grand challenge and be facilitated to find solutions for directed problems.

22. Is a letter from Spoke agency mandatory for first level submission?

A letter from the Spoke agency is preferred. However, complete details of the spokes may be submitted within three months after the approval.

23. Is industry participation mandatory?

Yes, industry/startup/PSU participation is mandatory with at least one-third financial contribution (preferably in cash). However, industry/user/others may contribute more than 1/3rd of the total contribution.

24. Can industry be the Lead PI or Implementing Agency?

No. Industry cannot apply as LPI or Implementing Agency. However, industry participation is mandatory as a co-funding and co-development partner.

25. What is the role of industry partners?

Some of the key roles of industry partners are as follows:

i. Co-develop technology
ii. Provide testing facilities
iii. Support trials and validation
iv. Conduct market studies
v. Enable commercialization and scale-up
vi. Support the establishment of Infrastructure, Capital and deploy manpower.

26. Can industry support be in-kind?

Yes, but cash contributions are preferred.

27. Is Letter of Agreement (LoA) with Industry/user mandatory?

Yes, a LoA must be submitted along with the Detailed Project Report (Detailed Proposal).

28. What is the definition of User/ User Agency/Others?

User/User Agency/ Others refer to collaborative entities such as industry partners, start-ups, PSUs, private companies, and government bodies that actively engage with the Hub, Spokes, and Spikes to support the development, validation, and commercialization of 2D materials-based technologies. These users may also include line ministries, departments, agencies, and state governments.

29. How many focus areas are to be proposed under proposal?

At least two focus areas out of the following need to be selected (not limited to):

(viii) Sensors for various sectors
(ix) Electronics and Optoelectronics devices (such as LEDs, photodetectors,)
(x) Memory devices
(xi) Neuromorphic technologies, and 2D memristor devices
(xii) Quantum technologies
(xiii) Co-integration with established technologies such as CMOS, FinFET, etc.
(xiv) Challenges specific to Strategic Sector (EMI Shield, Flexible Electronics, etc.)

30. What are the expected deliverables (Key Performance Indicators (KPIs))?

i. At least 2 market ready products (Purely software-based products will not be considered as per user requirement by the end of project. The complete value chain for the identified products/technology (design, development, testing, packaging etc.)

ii. Tangible technologies with high TRL >7
iii. Number of good quality IPs (not less than 10 IPs) (The IPR norms will be as per ANRF and MeitY)
iv. No of ToTs (not less than 5 ToTs)
v. Total number of startups
    a. to be incubated (minimum 3)
    b. to be mentored (minimum 10 startup)
    c. that can access the facilities in reasonable & transparent manner
vi. Short-term, mid-term and long-term milestones and deliverables
vii. Plan for technology exploitation and market readiness
viii. Skilled Manpower

31. Can software-only products be proposed as a targeted technology/product?

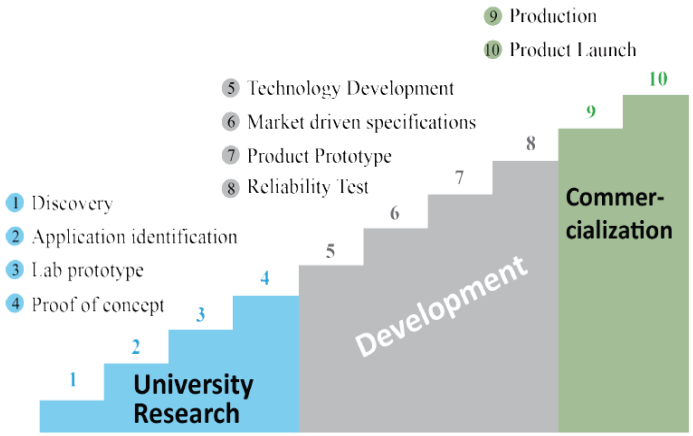
No, only hardware-based solutions are to be proposed as expected deliverable.

32. What TRL levels are targeted?

The Hub should aim for TRL 7–9, with deliverables leading to commercialization.

33. What is Technology Readiness level (TRL)?

"Technology Readiness Level (TRL)" is a metric to measure the maturity of the developed technology. It is generally measured in the scale from 1 to 9. However, TRL 10 is also sometimes considered as productization of the developed technology. A project is evaluated against set parameters for each TRL and is rated based on its progress. The broad targeted milestones for each TRL are as follows: -



34. What is the project duration?

Maximum of 5 years, with a mandatory sustainability plan beyond the project period.

35. What is the funding structure?

The following budget mechanism is proposed for the proposals:

i. If the Total proposed budget is less than Rs.525 crore: ANRF and MeitY will contribute 2/3rd of the total outlay and participating Industry/User is supposed to provide the rest 1/3rd (in-cash (preferred) or in-kind)
ii. If the Total proposed budget is Rs.525 crore or more than Rs.525 crore: Additional funding requirement may be sought from the Industry/Users or any other stake holders.
iii. If the cost of land, civil construction and clean room are included, it will be considered as maximum 5% of the total budget or in actuals, whichever is less.
iv. Maximum of Rs. 5 crore should be provisioned for each identified spoke.
v. Funding may be proposed for the PIs participating from other institutions (excluding capital head).

36. What is the process of fund distribution within the Hub?

The Hub, as a Section-8 Company, will allocate funds to Spokes and Spikes based on planned activities and milestones.

37. What can be the total outlay of the project?

i. If the Total proposed budget is less than Rs.525 crore: ANRF and MeitY will contribute 2/3rd of the total outlay and participating Industry/User is supposed to provide the rest 1/3rd (in-cash (preferred) or in-kind)
ii. If the Total proposed budget is Rs.525 crore or more than Rs.525 crore: Additional funding requirement may be sought from the Industry/Users or any other stake holders.

38. Can land cost, civil construction and clean room be included in the proposal?

If the cost of land, civil construction and clean room are included, it will be considered as maximum 5% of the total budget or in actuals, whichever is less.

39. Can the industry funding be more that 1/3rd of the total outlay (minimum funding)?

Yes, the industry funding can be more that 1/3rd of the Total outlay of the project.

40. Is there any provision for funding Spokes?

Maximum of Rs. 5 crores should be provisioned for each identified spoke.

41. What is the mode for submitting the proposal?

Proposals need to be submitted only through online portal: www.anrfonline.in. Submissions through other platforms (hardcopy, email, etc,.) are not accepted.
The link for submitting the proposal can be accessed through the ANRF website (www.anrfonline.in) and MeitY Official website www.meity.gov.in.

42. What documents are required for submission?

i. Concept Note

ii. LPI and PI Performa
iii. Endorsement letters from LPI and PI institutes
iv. Consent letters
v. Plagiarism Report
vi. Other Technical Details
vii. Detailed Project Report

viii. Letter of Agreement from Industry

Refer Section 13 in CFP document for complete details.

43. Is a plagiarism report required during submission?

Yes, plagiarism report is mandatory.

44. What is the policy on Intellectual Property Rights (IPR)?

IPR policies must be well-defined. Non-exclusive licenses are preferred; industry may be granted first right of refusal based on their contributions.

45. How are proposals evaluated?

Through a two-stage process by an Expert Committee:

i. Concept Note screening
ii. Full Proposal review based on scientific merit, innovation, commercialization, and sustainability

46. What are the key timelines?

Deadlines for both concept notes and full proposals will be available on the portal.