

Indian Science Technology and Engineering facilities Map (I-STEM)

Invites application for

1. **Partial financial support for using R&D facilities in other institutions through the I-STEM web portal to Users from Academic Institutions and Start-ups (Format-1)**

Format for requesting support for accessing and using facilities through the I-STEM web portal.

(i) Details of the Personal Information

- a. Name of the Researcher **Suraj P. Ramteke**
- b. Name of the Institution **Sant Gadge Baba Amravati University, Amravati**
- Name of the Department **Department of Physics**
- c. Degree registered for **PhD**

(ii) Project/Research topic Details:

- a. Research Title: **Growth and Study of Pure and Doped Inorganic Crystals for Nonlinear Optical Device Applications**
- b. Sub area: **Crystal growth , Non-Linear Optics**
- c. Area Description: **Physics**
- d. Aims & Objective (in Bullets):
 - **Synthesis of single crystals of inorganic materials using a cost-effective method.**
 - **Grown crystals will be explored at the Physico-chemical attributes from an application perspective. To evaluate the suitability for NLO device applications, spectroscopic, structural, optical, electrical, mechanical, and thermal characteristics will be carried out.**
- e. Duration (MM/YYYY):
- f. Project Summary (1000 words):

Nonlinear optical (NLO) materials are being implemented in current tech because they have the structural features essential for fabricating high-quality units used in future photonic products. We intend to explore, investigate, and produce innovative crystals to assess their potential function in photonic device applications. Bulk crystals with superior optical, electrical, mechanical, thermal, and Structure and properties will emerge as future prospective materials with low commercial value for integrated and multidisciplinary technical applications such as photonics, microelectronics, optoelectronics, electro-optic modulators, detectors, actuators, SHG transmission devices, and laser systems. Considering crystals are employed, it is vital to test the potential effects of nonlinear optics on the specific application. Several studies have already been conducted for this goal. For many decades, inorganic materials have been employed to build and manufacture unique NLO crystals. An inorganic class of materials attracts the attention of researchers from all over the community due to their ability to initiate themselves in the form of a single crystal with a wide transparency window, huge NLO figure of excellence for frequency conversion, high optical response, and phase match-ability. These materials also offer greater advantages than their organic counterparts, such as design flexibility and

mechanical/environmental stability in high-energy applications. The study's purpose is to evaluate crystals for effective non-linear optical applications. Inorganic crystals will be synthesized. Grown crystals will be investigated in terms of their physicochemical properties from an application standpoint. Spectroscopic, structural, optical, electrical, mechanical, and thermal properties will be evaluated to determine suitability for NLO device applications. The data will be analyzed, and a decision will be taken on the possible application.

(Separate page may be attached to justify the requirements)

g. Technical Details

- a. TRL
- b. Methodology
- c. Design & development
- d. Facilities and Instrumentation required :
- e. Consumables (Scientific materials) Chemicals and Glassware, Membrane

Filter paper

h. Expected output and outcome

i. Industry/Institute CollaborationIf, yes

- (i) Name of the Collaborating Industry/Institute
- (ii) Collaboration Details
- (iii) Additional Details if any

j. Funding required from I-STEM (with justification:

Funding is required for characterization goals such as laser damage threshold, optical limiting, dielectric study, and photoconductivity.

Request:

I am a PhD student who does not have a fellowship and requires funds for fees, a laptop, and daily living expenses. (If at all feasible)

Google Scholar:

<https://scholar.google.com/citations?user=Yp1W5hMAAAAJ&hl=en>

Scopus:

<https://www.scopus.com/authid/detail.uri?authorId=57193507466>

Details of Requirements&Mode of the Engagement:(Attach the quotation for the consumables)

- (i) Short term Engagement:
 - a. Usage of testing/characterization facilities across the country (Characterization Mode)
 - i. Testing Charges
 - ii. Consumable charges
 - iii. Travel Cost (Boarding and Lodging, if any)
 - b. Usage of fabrication and testing facilities across the country (Fabrication Mode)
 - i. Fabrication and testing Charges
 - ii. Consumable charges (if any)
 - iii. Travel Cost (Boarding and Lodging, if any)
- (ii) Medium term Engagement:
 - a. Execution of project in any one of the Host Institution (Project Mode)
 - a. Fabrication and or testing Charges

- b. Consumable charges (if any)
 - c. Travel Cost (Boarding and Lodging, if any)
- b. Execution of project in Multi Host Institutions (Project Mode)
 - a. Fabrication and or testing Charges
 - b. Consumable charges (if any)
 - c. Travel Cost (Boarding and Lodging, if any)

(Round-trip to the Host Institution by 2nd class (Non-AC) railway via the nearest route)

Details of User's Bank Account:

(Please send a copy of the cancelled cheque/copy of the passbook carrying all the information needed)

Beneficiary Name (User's name)

PAN: AXFPR0882B

Bank Account No. **62489618214**

Name of the Branch: STATE BANK OF INDIA, PLOT NO67 WARD NO07 GANDHI CHOWKPULGAON
DEOLI TQ WARDHA DISTRICT MAHARASHTRA

IFSC Code: **SBIN0021510**

Note: Proposed proposal must be executed within stipulated duration (max. 6 month) to avoid fund availability issues. Travel form will be provided by the I-STEM office. The users will submit the technical report, original invoice (duly signed by the Head of the Institution) raised by the Host Institution through I-STEM portal only along with a copy of the travel forms and original tickets through post to the Nodal Officer, I-STEM, Indian Institute of Science, Bangalore. A scan copy of all the documents may be sent in advance.