DIT UNIVERSITY

IMAGINE ASPIRE ACHIEVE

DIT University

Report

SDG-6

PREFACE

Water is essential requirement of life. If water is pure it can sustain lifeforms on the other aspect, polluted water is the cause of disaster. UN SDG 6 promotes 'Clean Water and Sanitation' ensuring access to water and sanitation for all. All stakeholders of society are having the fundamental rights to access this resource in easily accessible and clean form. Also the society must ensure the water as resource must not be polluted by human activities. Wastage must be eradicated. At present, it is becoming very difficult to obtain sufficient quantity and good quality water. All this is due to unscientific usage. Also the resource is continuously diminishing at various sources and going out of access to certain sections of society. So it is our duty to ensure the sustainability of water through pollution mitigation, judicious usage and environmental awareness. DIT University promotes this objective through its policy of sustainable water usage, reuse of waste water, conservation principle and promoting same through research and outreach activities.

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IMAGINE ASPIRE ACHIEVE

DIT University

Report

CONTENTS

DIT University

Report

University's research activities at Regional, National and Global Level on Water

DIT University through its centers of Excellence is extensively involved in research activities at global, national and regional scale with Government agencies and National, International Institutes of eminence for collaborative research on water issues and developing technological solutions.

Global Level:

Dr. Ravi Shukla, Department of Physics, DIT University through Center of Excellence in Advanced Functional Smart Materials Lab has research collaboration with **Prof. Achintya N Bezbaruah,** Nanoenvirology Research Group, Civil, Construction and Environmental Engineering, North Dakota State University, Fargo, North Dakota 58105, USA

The research Objective: Water treatment with advanced technology

The research outcome of the Collaboration:

Chamoli, P., Shukla, R. K., Bezbaruah, A. N., Kar, K. K., & Raina, K. K. (2021). Rapid microwave growth of mesoporous TiO2 nano-tripods for efficient photocatalysis and adsorption. *Journal of Applied Physics*, *130*(16).

Chamoli, P., Shukla, R. K., Bezbaruah, A. N., Kar, K. K., & Raina, K. K. (2021). Microwave-assisted rapid synthesis of honeycomb core-ZnO tetrapods nanocomposites for excellent photocatalytic activity against different organic dyes. *Applied Surface Science*, *555*, 149663.

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Report

National Level

Dr. Tarumay Ghoshal, from Center of Excellence in Land, Air and Water (Environmental Sustainability), DIT University has received a sponsored research funded project from **Science and Engineering Research Board (SERB), Department of Science and Technology, Government of India in 2018 which was functional till September 2021.**

Project Title: Implication of data assimilation for identifying short scale variations in various biogeochemical characteristics in the Bay of Bengal through Regional Ocean Model Simulations

Project Cost: INR 1556000

Research Outcomes:

Ghoshal, T., & Chakraborty, A. (2021, December). Regional Ocean Modeling System (ROMS) Simulations to Identify the Sensitivity of Forcing Conditions on the Thermohaline Features of the Bay of Bengal. In *International conference Sustainable Environmental Engineering and Science* (pp. 33-43). Singapore: Springer Nature Singapore.

Ghoshal, T., & Chakraborty, A. (2019). Response of quick scatterometer wind forcing on the ROMS simulation during 'MALA' cyclone.

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IISER KOLKATA

Certificate of Participation

This is to certify that

Dr. Tarumay Ghoshal

has presented a poster in Plenary Session 1: Space based meteorology, oceanography, geosphere-biosphere interactions of the 21st National Space Science Symposium held from 31 January to 4 February, 2022.

Date: 8 March, 2022
Place: IISER Kolkata, India

(Dibyendu Nandi)
LOC Chairperson, NSSS 2022

(A. S. Kiran Kumar)
NOC Chairman, NSSS 2022

Registration ID NSSS-20220110122448

7th National Conference of the Ocean Society of India (OSICON-21)

Certificate of Participation

OSI OCEAN SOCIETY OF INDIA

This is to certify that

TARUMAY GHOSHAL

has participated in the Seventh National Conference of the Ocean Society of India (OSICON-21) organised by National Centre for Polar and Ocean Research (NCPOR), Ministry of Earth Sciences (MoES), Goa and Ocean Society of India (OSI) during 12-14 August, 2021.

Dr. Anilkumar N
Convenor, OSICON-21

NCPOR

Dr. M. Ravichandran
President, OSI

DIT University

Report

Regional Level:

Dr. Jabrinder Singh, from Center of Excellence in Land, Air and Water Water (Environmental Sustainability), DIT University has received a sponsored research funded project from **Uttarakhand State Council for Science and Technology on 15.03.2021 for one year**.

The project title:

"Appraisal of environmental streamflow of Rispana with reference to spatio-temporal variation of water quality index and catchment potential"

Project Cost: INR 404000

At Regional and Local level:

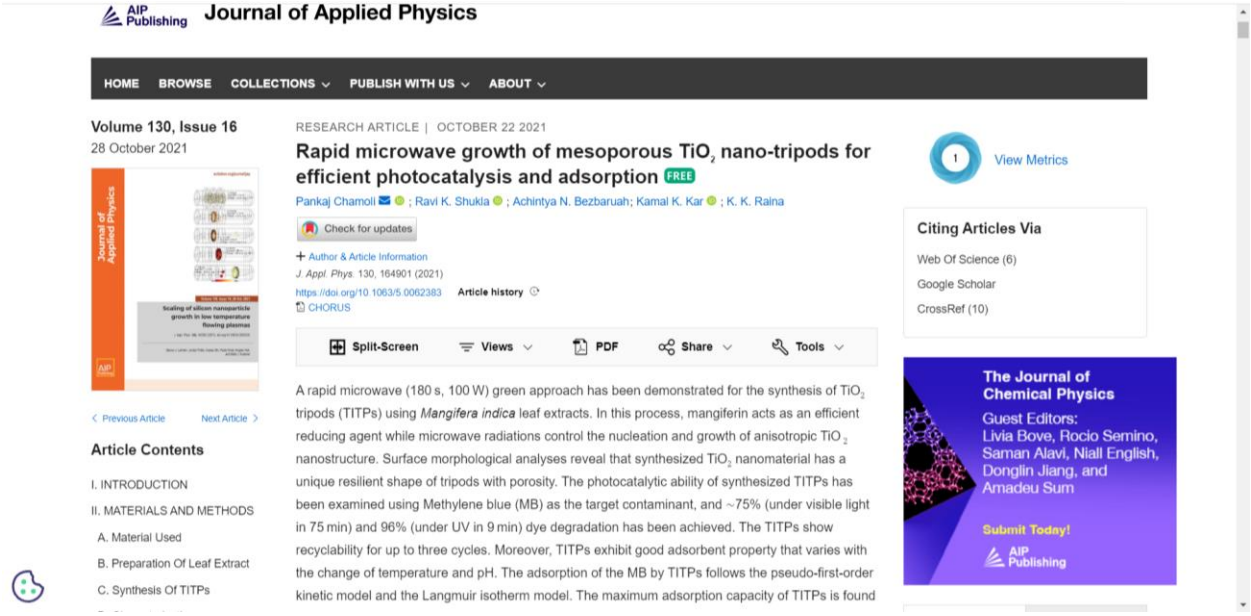
Center of Excellence in Land, Air and Water (Environmental Sustainability) and Department of Civil Engineering is jointly working with Uttarakhand Pollution Control Board (UKPCB) on water quality parameters on River Ganga and its tributaries.

Joint Research: **Mr. Sarada Prasanna Subudhi**, official from UKPCB is pursuing PhD in the department of Civil Engineering, DIT University (**Roll No: 198170002**).

DIT University

Report

Research Publications



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28 October 2021

RESEARCH ARTICLE | OCTOBER 22 2021

Rapid microwave growth of mesoporous TiO_2 nano-tripods for efficient photocatalysis and adsorption FREE

Pankaj Chamoli; Ravi K. Shukla; Achintya N. Bezbaruah; Kamal K. Kar; K. K. Raina

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Author & Article Information

J. Appl. Phys. 130, 164901 (2021)

https://doi.org/10.1063/5.0062383 Article history

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Article Contents

I. INTRODUCTION

II. MATERIALS AND METHODS

A. Material Used

B. Preparation Of Leaf Extract

C. Synthesis Of TITPs

A rapid microwave (180 s, 100 W) green approach has been demonstrated for the synthesis of TiO_2 tripods (TITPs) using *Mangifera indica* leaf extracts. In this process, mangiferin acts as an efficient reducing agent while microwave radiations control the nucleation and growth of anisotropic TiO_2 nanostructure. Surface morphological analyses reveal that synthesized TiO_2 nanomaterial has a unique resilient shape of tripods with porosity. The photocatalytic ability of synthesized TITPs has been examined using Methylene blue (MB) as the target contaminant, and ~75% (under visible light in 75 min) and 96% (under UV in 9 min) dye degradation has been achieved. The TITPs show recyclability for up to three cycles. Moreover, TITPs exhibit good adsorbent property that varies with the change of temperature and pH. The adsorption of the MB by TITPs follows the pseudo-first-order kinetic model and the Langmuir isotherm model. The maximum adsorption capacity of TITPs is found

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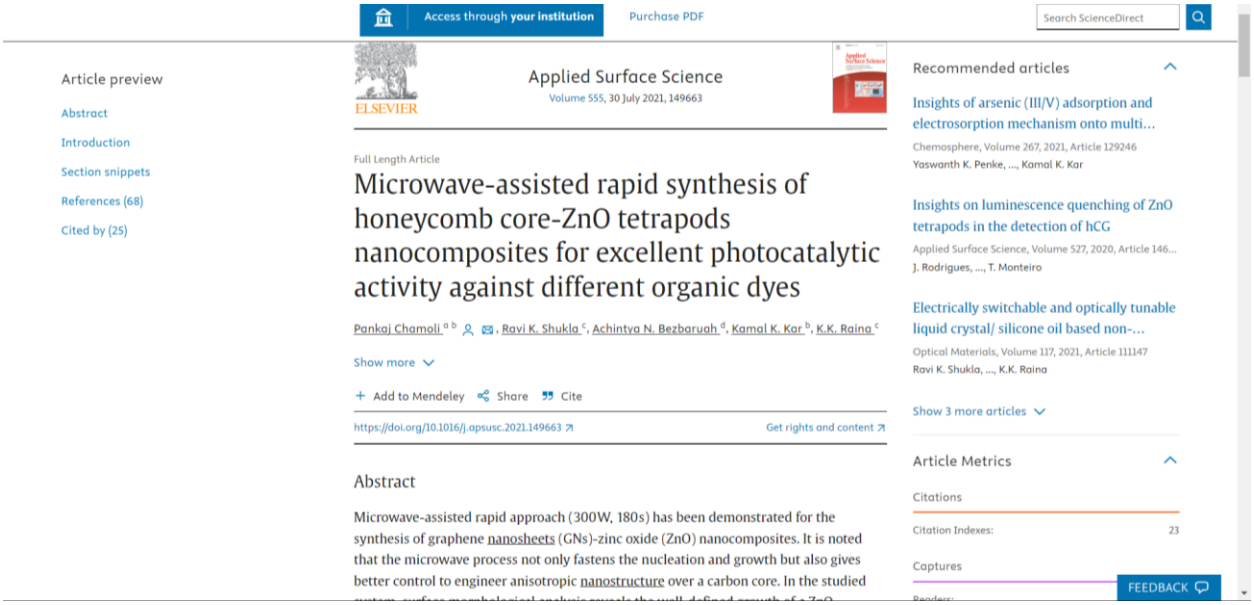

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Applied Surface Science
Volume 555, 30 July 2021, 149663

Full Length Article

Microwave-assisted rapid synthesis of honeycomb core-ZnO tetrapods nanocomposites for excellent photocatalytic activity against different organic dyes

Pankaj Chamoli [a b], Ravi K. Shukla [c], Achintya N. Bezbaruah [d], Kamal K. Kar [b], K.K. Raina [c]

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https://doi.org/10.1016/j.apsusc.2021.149663 Get rights and content

Abstract

Microwave-assisted rapid approach (300W, 180s) has been demonstrated for the synthesis of graphene nanosheets (GNs)-zinc oxide (ZnO) nanocomposites. It is noted that the microwave process not only fastens the nucleation and growth but also gives better control to engineer anisotropic nanostructure over a carbon core. In the studied

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Regional Ocean Modeling System (ROMS) Simulations to Identify the Sensitivity of Forcing Conditions on the Thermohaline Features of the Bay of Bengal

Tarumay Ghoshal & Arun Chakraborty

Conference paper | First Online: 26 April 2023

84 Accesses

Part of the Lecture Notes in Civil Engineering book series (LNCE,volume 323)

Abstract

The Bay of Bengal (BOB) is known for prominent seasonal and annual climatic variability. The bay is locked from three directions, north, east, and west, and open to the Indian Ocean from the southern direction. BOB experiences local and remote effects in its thermohaline features. The BOB always has a higher surface temperature (SST) compared to the Arabian Sea which can be observed from basin average SST values. The semiannual signal in those SST values shows higher than 26 °C. The basin is very much prone to various categories of cyclones which are known to cause prominent upwelling and mixing in the basin. However, most of the times, satellite data cannot track the thermohaline changes within a short period of time due to poor temporal and spatial resolutions and that too only limited to the surface, not below it. Moreover, in situ data are not sufficient or not present at the required locations to provide the data for the particular event. The same situation is also prevalent for remote effects when Indian Ocean Dipole (IOD) and El Nino-Southern Oscillation (ENSO) events create surface-to-subsurface thermohaline variability. Therefore, these problems can be tackled through numerical modeling where a realistic initial condition will provide much more accurate results within a short time gap. To meet this objective, Regional Ocean Modeling System (ROMS) is set up for BOB with a climatological run. In addition, forcing conditions and initial conditions are adopted for specific events like IOD, ENSO, or cyclones. Satellite-derived wind velocity

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Impact Examination of the Lockdown on the Status of the Heavy Metal Pollution Index and Health Risk of Ganga River Water Quality

Sarada Prasanna Subuddhi[1], Ankur Kansal[1], Prashant Pandey[1], Tarumay Ghoshal[2,†], Naveen Singhal[3]

[1]Uttarakhand Pollution Control Board, 46-B Gauradevi Paryavaran Bhawan, IT Park, Sahastradhara Road, Dehradun-248001, Uttarakhand- India

[2]Center of Excellence in Land, Air and Water (LAW), Department of Civil Engineering, DIT University, Dehradun, Uttarakhand- India

[3]Center of Excellence in Land, Air and Water (LAW), Department of Chemistry, DIT University, Dehradun, Uttarakhand- India

[†]Corresponding author: E-mail: tarumay.iit@gmail.com, Tel: +91 9333168391, Fax:

Received September 6, 2022 Revised November 29, 2022 Accepted December 25, 2022

Abstract

Ganga River is the lifeline for socio-economic development of India. The unlimited desire of human and anthropogenic activities degraded the water quality of Ganga River, especially in Haridwar. The present study investigated the significant impact of lockdown on physio-chemical status of the Ganga River in Haridwar. Study also revels the significant augmentation

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Recent Trends of Temporal and Spatial Variation in Waste Generation and Its Impacts on River Water Quality: Special Emphasis on Suswa and Song Rivers of Uttarakhand

S. P. Subudhi, Ankur Kansal, Tarumay Ghoshal, Naveen Singhal & Damini Rana

Conference paper | First Online: 25 April 2023

66 Accesses

Part of the Lecture Notes in Civil Engineering book series (LNCE,volume 301)

Abstract

Survival and procreation of life on the planet is dependent on the water resources. Water being an unreplaceable vital resource sustains life of the species, ecological processes, agricultural and other developmental activities. A watershed is a natural structure for developing efficient utilization of precipitation that fluctuates spatially and temporally. Around 80% of untreated waste in the world is disposed from domestic and industrial sources which is creating a threat to living organisms. Different sampling sites were studied in Doon valley for a period of one year. Parameters chosen for the study are: Physicochemical parameters—pH, electrical conductivity, total hardness; Biological parameters—dissolved oxygen, biological oxygen demand; Bacterial pollution indicator parameters—total coliforms; Pesticides—Benzene hexachloride and endosulfan. According to the findings, there are significant deviations between different sites and parameters chosen. Water quality has been found to be

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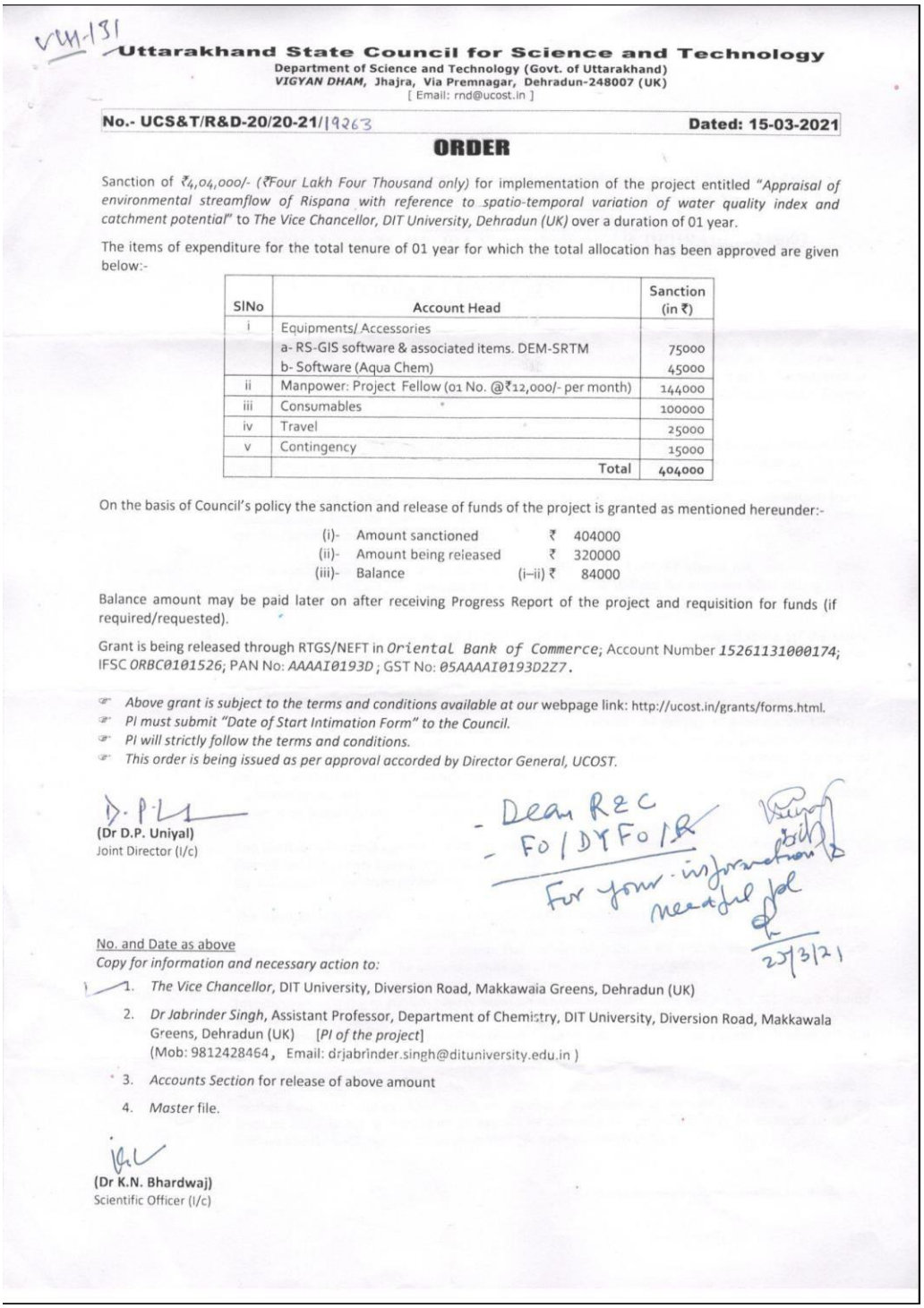
Report

Government Sponsored Funded Project Sanction Orders



VCM-131

Uttarakhand State Council for Science and Technology
Department of Science and Technology (Govt. of Uttarakhand)
VIGYAN DHAM, Jhajra, Via Premnagar, Dehradun-248007 (UK)
[Email: rnd@ucost.in]

No.- UCS&T/R&D-20/20-21/9263 **Dated: 15-03-2021**

ORDER

Sanction of ₹4,04,000/- (₹*Four Lakh Four Thousand only*) for implementation of the project entitled "*Appraisal of environmental streamflow of Rispana with reference to spatio-temporal variation of water quality index and catchment potential*" to *The Vice Chancellor, DIT University, Dehradun (UK)* over a duration of 01 year.

The items of expenditure for the total tenure of 01 year for which the total allocation has been approved are given below:-

SlNo	Account Head	Sanction (in ₹)
i	Equipments/ Accessories	
	a- RS-GIS software & associated items. DEM-SRTM	75000
	b- Software (Aqua Chem)	45000
ii	Manpower: Project Fellow (01 No. @₹12,000/- per month)	144000
iii	Consumables	100000
iv	Travel	25000
v	Contingency	15000
	Total	404000

On the basis of Council's policy the sanction and release of funds of the project is granted as mentioned hereunder:-

(i)- Amount sanctioned ₹ 404000
(ii)- Amount being released ₹ 320000
(iii)- Balance (i–ii) ₹ 84000

Balance amount may be paid later on after receiving Progress Report of the project and requisition for funds (if required/requested).

Grant is being released through RTGS/NEFT in *Oriental Bank of Commerce*; Account Number *15261131000174*; IFSC *ORBC0101526*; PAN No: *AAAAI0193D*; GST No: *05AAAAI0193D2Z7*.

- *Above grant is subject to the terms and conditions available at our* webpage link: http://ucost.in/grants/forms.html.
- *PI must submit "Date of Start Intimation Form" to the Council.*
- *PI will strictly follow the terms and conditions.*
- *This order is being issued as per approval accorded by Director General, UCOST.*

D. P. L.
(Dr D.P. Uniyal)
Joint Director (I/c)

- Dean R&C
- FO/DY FO/A
For your information & needful pl
23/3/21

No. and Date as above
Copy for information and necessary action to:

1. *The Vice Chancellor*, DIT University, Diversion Road, Makkawaia Greens, Dehradun (UK)
2. *Dr Jabrinder Singh*, Assistant Professor, Department of Chemistry, DIT University, Diversion Road, Makkawala Greens, Dehradun (UK) [*PI of the project*]
   (Mob: 9812428464, Email: drjabrinder.singh@dituniversity.edu.in)
3. *Accounts Section* for release of above amount
4. *Master* file.

(Dr K.N. Bhardwaj)
Scientific Officer (I/c)

DIT University

Report

FILE NO. EMR/2016/006392
SCIENCE & ENGINEERING RESEARCH BOARD(SERB)
(a statutory body of the Department of Science & Technology, government of India)
5 & 5A, Lower Ground Floor
Vasant Square Mall
Plot No. A, Community Centre
Sector-B, Pocket-5, Vasant Kunj
New Delhi-110070

Dated: 26-Feb-2018

ORDER

Subject: Financial Sanction of the research project titled **"Implication of data assimilation for identifying short scale variations in various biogeochemical characteristics in the Bay of Bengal through Regional Ocean Model Simulations"** under the guidance of Dr. TARUMAY GHOSHAL, Department of Civil Engineering, Dehradun Institute of Technology , Mussorie- diversion road, p.o. bhagwantpur,Dehradun, Dehradun, Uttarakhand-248009 and by Dr. Shailendra Kumar Tiwary, Professor, Department Of Civil Engineering, Dehradun Institute Of Technology - Release of 1st grant.

Sanction of **Science and Engineering Research Board (SERB)** is hereby accorded to the above mentioned project at a total cost of **Rs. 1556000/- (Rs.** Fifteen Lakh Fifty Six Thousand **Only)** with break-up of **Rs. *350000*/- under Capital (Non-recurring) head** and **Rs.*1206000*/- under General (Recurring) head** for a duration of 36 months. The items of expenditure for which the total allocation of **Rs. 1556000/-** has been approved are given below.
The following budget may be considered for **Dehradun Institute Of Technology, Mussorie- Diversion Road, P.O. Bhagwantpur,Dehradun**

S. No	Head	Total (in Rs.)
A	**Non-recurring**	
1	Equipment -> workstation with accessories	350000
A'	*Total (Non-Recurring)*	***350000***
B	**Recurring Items**	
1	Recurring - A : (Manpower) Recurring - B : (Consumables, Travel, Contingencies)	540000 524000
2	Recurring - C : (Overhead Charges)	142000
B'	*Total (Recurring)*	***1206000***
C	**Total cost of the project (A' + B')**	**1556000**

2. Sanction of the **SERB** is also accorded to the payment of
- **Rs. 350000/-** (Rupees Three Lakh Fifty Thousand only) under 'Grants for creation of capital assets' and **Rs. 403000/-** (Rupees Four Lakh Three Thousand only) under 'Grants-in-aid General' to **Vice Chancellor, Dehradun Institute Of Technology, Mussorie- Diversion Road, P.O. Bhagwantpur,Dehradun**
being the first installment of the grant for the year 2017-2018 for implementation of the said research project.

3. The expenditure involved is debitable to **Fund for Science & Engineering Research (FSER)**
This release is being made under Core Research Grant. (PAC Earth & Atmospheric Sciences)

4. The Sanction has been issued to Dehradun Institute Of Technology, Mussorie- Diversion Road, P.O. Bhagwantpur,Dehradun with the approval of the competent authority under delegated powers on **06 February, 2018** and vide Diary No. **SERB/F/9436/2017-2018** dated **16 February, 2018**

5. Sanction of the grant is subject to the conditions as detailed in Terms & Conditions available at website (www.serb.gov.in).

6. Overhead expenses are meant for the host Institute towards the cost for providing infrastructural facilities and general administrative support etc. including benefits to the staff employed in the project.

7. While providing operational flexibility among various subheads under head Recurring-A, it should be ensured that not more than Rs. 1.5 lakh each should be spent for travel and contingency.

8. As per rule 211 of GFR, the accounts of project shall be open to inspection by sanctioning authority/audit whenever the institute is called upon to do so.

9. The sanctioned equipment would be procured as per GFR and its disposal of the same would be done with prior approval of SERB.

10. The release amount of **Rs. 753000/-** (Rupees Seven Lakh Fifty Three Thousand only) will be drawn by the Under Secretary of the SERB and will be disbursed by means of RTGS transaction as per their Bank details given below:

Account Name	**DIT UNIVERSITY GRANT A/C**
Account Number	**15261131000174**
Bank Name & Branch	**Oriental Bank of Commerce Makkawala, Dehradun**
IFSC/RTGS Code	**ORBC0101526**
Email id of A/C Holder	**dy.fo@dituniversity.edu.in**
Email id of PI	**tarumay.iit@gmail.com**

11.The institute will furnish to the SERB, New Delhi, separate Utilization certificate(UCs) financial year wise to the SERB for Recurring (Grants-in-aid General) & Non-Recurring (Grants for creation of capital assets) and an audited statement of accounts pertaining to the grant immediately after the end of each financial year.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AND
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