Indian Institute of Technology Madras
Office of Alumni and Corporate Relations

1993 BATCH SILVER REUNION - NEW FACULTY INITIATION GRANT (NFIG)

2023 - 2024

ANNUAL REPORT

1993 BATCH SILVER REUNION

During the Silver reunion of the 1993 batch the donated towards “Student Wellness Activities”. The money was also used towards this New Faculty Initiation Grant.

To read the report on Student Wellness Activities *Click here*

NEW FACULTY INITIATION GRANT

The New Faculty Initiation Grant (endowment) is provided for the new faculty members of the institution to help them kick-start their research in the institution. It will aid in meeting the requirements of the research initiatives.

This grant is helpful to the new faculty in various ways like the purchase of equipment, travel expenses related to the research, purchase of software etc. It has also been instrumental in influencing them to start new research initiatives. Research of social importance are being carried out with this grant which is slowly impacting the society.

RECIPIENTS OF THE GRANT

Prof. Poguluri Sunny Kumar

Ocean Engineering

TITLE OF THE PROJECT

Hybrid Coupling of Finite Element Method-Fully Nonlinear Potential flow Theory (FEM-FNPT) and Navier-Stokes (NS) viscous solver using moving overlapping zone interface

BRIEF OBJECTIVES OF THE RESEARCH

- FEM-FNPT and NS solvers coupling
- Validation of the developed software for typical regular 2D non-breaking and breaking wave generation and compared against the published results

HIGHLIGHTS OF THE SCHEME'S UTILITY TOWARDS YOUR RESEARCH

The developed code has been applied to wide range of applications, including the generation of nonlinear waves such as regular, bichromatic, and directional waves. It has been extended for use with both fixed and floating bodies, enabling the estimation of nonlinear wave forces and moments, as well as modeling multiple-body interactions.

GRATITUDE NOTE TO THE DONOR

The funds received towards the versatile code development of nonlinear wave generation and its application to fixed and floating bodies has helped to execute the work in advancing the understanding and simulation of complex wave interactions, aiding in the development of more efficient and resilient marine structures. I am grateful for the support.

RECIPIENTS OF THE GRANT

Prof. Kannabiran Seshasayanan

Applied Mechanics and Biomedical Engineering

TITLE OF THE PROJECT

Role of extreme fluctuations in instabilities on a turbulent background

BRIEF OBJECTIVES OF THE RESEARCH

We aim to study the growth rate distributions in instabilities on a turbulent background. Comparing them with the distribution of spatial extremes will shed light on the role of strong fluctuations in these transitions.

HIGHLIGHTS OF THE SCHEME'S UTILITY TOWARDS YOUR RESEARCH

The NFIG scheme has helped kick start the research at IIT Madras by providing the necessary infrastructure in terms of desktops, storage to analyse data. The travel support also helps one to present results at international conferences.

GRATITUDE NOTE TO THE DONOR

We are thankful to the donors for providing us with the support to carry out fundamental research. We hope that they continue the support towards the upcoming new faculties in the years to come.

RECIPIENTS OF THE GRANT

Prof. Krishna Reddy Nandipati

Chemistry

TITLE OF THE PROJECT

Quantum dynamics of electronic ring currents in macrocyclic molecules

BRIEF OBJECTIVES OF THE RESEARCH

The generation and control of electronic currents in ring-shaped molecules have become a subject of much interest due to their potential applications in optoelectronics. Recent advances in femto and attosecond lasers triggered theoretical investigations in the generation of electronic ring currents in time-scales comparable to the fastest vibrational dynamics in molecules. However, the effect of vibronic couplings on these currents in molecules is poorly understood. The purpose of the present project is to investigate electronic ring currents by explicit consideration of vibronic couplings (VC) in molecules. The target system is magnesium porphyrin (MgPh). MgPh has become a theoretical testbed for generating ring currents that can produce magnetic fields.

The present project aims at systematic understanding the role of vibronic coupling effects on the ring currents in molecular systems by addressing the following questions:

- Can we build model Hamiltonians that will allow detailed understanding of the ring current dynamics under vibronic coupling?
- How can excited-state dynamics be treated accurately to obtain the spectrum?
- How can the ring currents be generated and probed by circularly polarized light?

HIGHLIGHTS OF THE SCHEME'S UTILITY TOWARDS YOUR RESEARCH

The grant was useful for buying basic computational facilities such as a laptop and couple of desktops to kick start my research in a modest way.

GRATITUDE NOTE TO THE DONOR

I thank you for your kind support to the new faculty through this scheme.

Thank you

We would like to take this opportunity again to express our heartfelt gratitude to all those who made benevolent contributions towards the growth and development of IIT Madras.

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