A report on national Webinar

On

Mathematical Modelling of Atmospheric Vortices

(May 17, 2022)

Organized by

Department of Mathematics
Faculty of Basic Sciences
Rajiv Gandhi University
(A Central University)
Itanagar, Arunachal Pradesh-791112

1. ORGANIZING COMMITTEE

Chief Patron: **Prof. Saket Kushwaha,** Hon'ble Vice Chancellor, Rajiv Gandhi University.

Patrons: **Prof. Amitava Mitra,** Pro-Vice Chancellor, Rajiv Gandhi Universit**y.**
Dr. N. Tadar Rikam, Registrar, Rajiv Gandhi University.
Prof. Sanjeev Kumar, Dean, Faculty of Basic Sciences, Rajiv Gandhi University.
Prof. Sahin Ahmad, Dean, Faculty of Engineering & Technology, Rajiv Gandhi University.

Chairperson: **Dr. Nipen Saikia,** Associate Professor, Head, Department of Mathematics, RGU.

Convenor: **Dr. Jagdish Prasad Maurya,** Assistant Professor, Department of Mathematics, RGU.

Organizing Members: **Prof. Sahin Ahmad**, Department of Mathematics, Rajiv Gandhi University.
Dr. Nipen Saikia, Associate Professor, Head, Department of Mathematics, RGU.
Dr. Saifur Rahman, Associate Professor, Department of Mathematics, RGU.
Mrs. **Dakjum Eshi**, Assistant Professor, Department of Mathematics, RGU.
Dr. Jagdish Prasad Maurya, Assistant Professor, Dept. of Mathematics, RGU.

2. EXECUTIVE SUMMARY

At the very outset the organizing chairperson, Dr. Nipen Saikia has greeted all the dignitaries in the online platform and welcome the Chief Guest Prof. Saket Kushwaha, Hon'ble Vice Chancellor, Rajiv Gandhi University, special guest Prof. Amitava Mitra, Pro-Vice chancellor Rajiv Gandhi University; Dr. N.T. Rikam, Registrar, Rajiv Gandhi University; Prof. Sanjeev Kumar, Dean of Faculty of Basic Sciences, RGU and Prof. Sahin Ahmed, Dean of Faculty of Engineering Sciences, RGU. Dr. Nipen Saikia expressed his hearty welcome to the Prof. Sanjay Kumar Pandey, Head of Department of Mathematical Sciences, IIT (BHU), Varanasi. He also extended his hearty welcome to all the participants in the Webinar. He mentioned the applications of mathematical modelling. He also elaborated the objective of the webinar, and he wished all the participants and also that the webinar will be enjoyable one and will remain very much beneficial for their future research work. The Convenor of the Webinar, Dr. Jagdish Prasad Maurya also welcomes Chief Guests, Resource person and participants and delivered the concept note and objective of the webinar. Special guest Prof. Sanjeev Kumar, Dean, Faculty of Basic Sciences**,** Rajiv Gandhi University delivered his valuable speech. He encouraged the participants to participate in the webinar sincerely and congratulate the Department of Mathematics for organizing this webinar. Special guest Prof. Sahin Ahmed**,** Dean, Faculty of Engineering Sciences**,** Rajiv Gandhi University delivered his valuable speech on webinar topic. He mentioned that the knowledge of differential equations and its solution is very important. He also talks about the mathematical modelling and its applications in different areas. He encouraged the participants for sincerely participations and congratulate the Department of Mathematics for organizing this webinar. Resource person Prof. Sanjay Kumar Pandey, Department of Mathematics, IIT (BHU), Varanasi started his speech by thanking Rajiv Gandhi University. He mentioned that good knowledge of mathematical modelling is very important for researchers working in applied mathematics. He talked about the theme of the webinar topic. Special Guest Dr. N. T. Rikam, Registrar, Rajiv Gandhi University delivered his valuable speech. He mentioned the importance of mathematical modeling in the field of science and technology. He expresses his thanks to the organizing committee for conducting such an important program in the University. Special Guest

Prof. Amitava Mitra**,** Pro-Vice Chancellor, Rajiv Gandhi University delivered his valuable insights on the webinar topic. He wishes best of luck to the organizer and the participants. Chief Guest Prof. Saket Kushwaha, Hon'ble Vice Chancellor, Rajiv Gandhi University delivered his inspiring speech on the topic of the webinar, mentioning the importance of research in this area. The Hon,ble VC Prof. Saket Kushwaha, RGU has said that mathematical modelling of atmospheric vortices particularly tropical cyclones is most important topic of the Research in Science and Technology. He shared some important concepts of atmospheric vortices and also mentioned that the occurrence of tropical cyclones causes great loss of properties, infrastructure, life etc. Hon'ble VC in his lecture had mentioned that complete knowledge of their occurrence, dynamics and main characteristics would save the lives of the living people in costal area and also reduce the loss of infrastructure. He extend his thanks to the expert for giving their valuable time and wishes to the participants to enjoy this webinar. He also congratulated the Department of Mathematics and encouraged the participants and wishes best of luck to the organizer and the participants. Finally the Convenor of the Webinar Dr. Jagdish Prasad Maurya has extended the vote of thanks and concludes the Inaugural session of the webinar. The technical session of the webinar started with the talk by resource person Prof. Sanjay Kumar Pandey, Head of Department of Mathematical Sciences, IIT (BHU), Varanasi. Total 120 participants have registered and 88 have participated in the webinar.

3. **RESOURCE PERSON:** Prof. Sanjay Kumar Pandey, Head, Department of Mathematics, IIT (BHU), Varanasi**.**

About the Resource person

Prof. Sanjay Kumar Pandey is a Professor of Mathematics and the Head of the Department of Mathematical Sciences at the Indian Institute of Technology (BHU), Varanasi, India. His expertise lies in mathematical modelling, biomechanics, fluid mechanics, and digital image processing and graph theory.

4. ABOUT THE WEBINAR

Mathematical modelling plays an important role in analyzing the physical behaviour of real-life problems by involving the multidisciplinary domains of science and engineering. This webinar provides an introduction to mathematical modeling and applications to atmospheric vortices such as whirlwinds, dust-devils, tornadoes and tropical cyclones etc. It will provide participants with necessary fundamental knowledge of mathematical modeling to solve the problems of atmospheric vortices and other real-life problems. This webinar also covers the current and future applications to solve the real-life problems using mathematical modeling concepts through different mathematical tools, including mathematical modelling through differential equations. New discoveries of mathematical tools for the solution of nonlinear equations governing motion could be of immense help. Hugeness and might of the atmospheric vortices remain troublesome reasons in investigation. Therefore much more sophisticated and advanced engineering tools and devices need to be invented to overcome uncontrolled nature of such terrifying vortices. This webinar is therefore organized to discuss some important fundamental characteristics of atmospheric vortices.

5. Technical Session

At the very outset of technical session the speaker Prof. Sanjay Kumar Pandey extends his hearty thanks to the Rajiv Gandhi University for inviting him in this very valuable webinar. He emphasized the

relevance of the topic of the webinar with present scenario. Prof. Pandey presents a power point presentation to give the participants a clear idea about the mathematical modelling and its application to atmospheric vortices. He focused on the key aspects of the webinar topic by spotting some light on the mathematical modelling of whirlwinds. He also congratulates the Department of Mathematics, Rajiv Gandhi University for organizing such type of webinar. On the interactions session he encourages the participants with new ideas and techniques. He also encourage the participants to work hard and productive research work.

6. Interactive session

In the interactive session, the participants had actively involved in question and answer session. Many participants showed great satisfaction with the response of the resource person which makes that the intent of conducting webinar was successful.

7. Closing Remarks

The webinar ended at 4.30 pm with a closing note from Chairperson of the Webinar Dr. Nipen Saikia, Head of the Department of Mathematics, Rajiv Gandhi University.

8. Appendices and Annexure

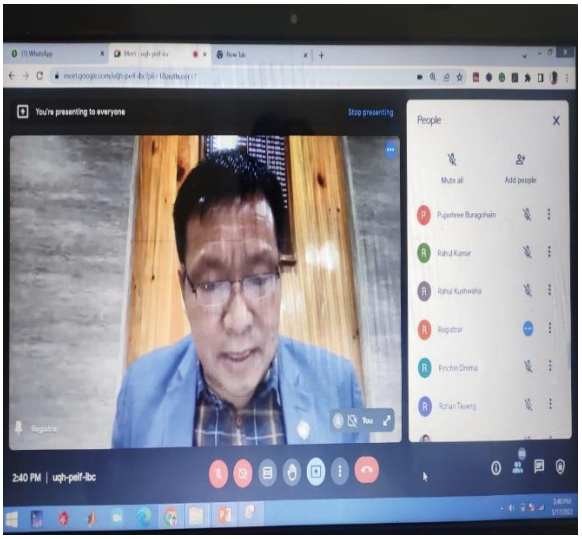
8.1. Annexure 1- Programme Schedule

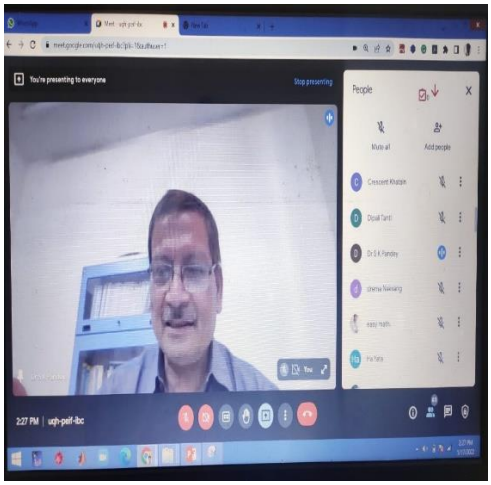
Inaugural Session	
02.00 PM to 02.05 PM	Welcome Address by **Dr. Nipen Saikia**, Head, Department of Mathematics, Rajiv Gandhi University.
02.05 PM to 02.10 PM	About the Webinar by **Dr. Jagdish Prasad Maurya**, Convenor.
02.10 PM to 02.15 PM	Address by **Prof. Sanjeev Kumar,** Dean, Faculty of Basic Sciences**,** Rajiv Gandhi University
02.15 PM to 02.20 PM	Address by **Prof. Sahin Ahmed**, Dean, Faculty of Engineering and Technology**,** Rajiv Gandhi University.
02.20 PM to 02.30 PM	Address by **Prof. Sanjay Kumar Pandey,** Head Department of Mathematical Sciences, Indian Institute of Technology (BHU), Varanasi.
02.30 PM to 02.35 PM	Address by **Dr. Nabam Tadar Rikam,** Registrar, Rajiv Gandhi University.
02.35 PM to 02.45 PM	Address by **Prof. Amitava Mitra**, Hon'ble Pro-**Vice Chancellor,** Rajiv Gandhi University.
02.45 PM to 02.55 PM	Address by **Prof. Saket Kushwaha**, Hon'ble **Vice Chancellor,** Rajiv Gandhi University.
02.55 PM to 03.05 PM	Vote of Thanks by **Dr. Saifur Rahman**, Associate Prof. Dept. of Mathematics, Rajiv Gandhi University.
Technical Session	
03.05 PM to 4.05 PM	Webinar Talk by **Prof. Sanjay Kumar Pandey,** Head, Department of Mathematical Sciences, Indian Institute of Technology (BHU), Varanasi
04.05 PM to 04.15 PM	Closing Remarks by **Dr. Jagdish Prasad Maurya**, Convenor.

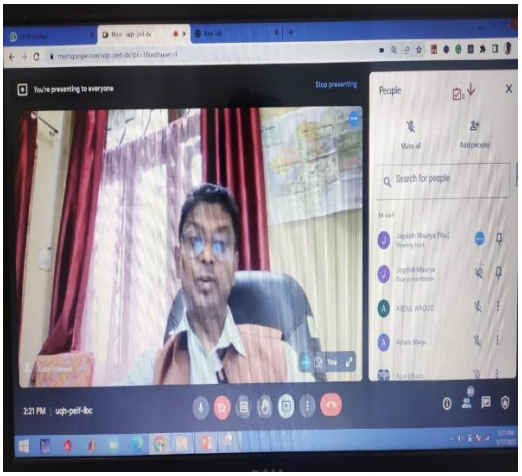
8.2.Annexure 2- Number of participants

Total 120 participants from every state of India have registered and 88 participants participated in the webinar. Faculty members, Research Scholars, PG and UG students participated in the webinar.

8.3.Annexure 3 – Photographs







(Dr. Nipen Saikia)
Chairperson and Head,
Department of Mathematics,
Rajiv Gandhi University

(Dr. Jagdish Prasad Maurya)
Convenor, Assistant Professor,
Mathematics Department
Rajiv Gandhi University