

### 3-DAY WORKSHOP ON

# MIGRATION, NAVIGATION and BIO-MIMICKING AERIAL VEHICLES (BMAV-18)

(Course Code: NERTU/SC/71)

(THU-SAT, 01-03, NOVEMBER 2018)



Center for Biotechnology, Institute of Science and Technology, JNTUH, Hyderabad  
Collaboration (Technical) with  
Research and Training Unit For Navigational Electronics, Osmania University, Hyderabad  
IEEE Hyderabad Section  
Sponsored BY TEQIP – III, IST, JNTUH



**Location :** CBT, IST JNTUH  
**Time :** 09.30AM – 05.30PM

#### Faculty

1. Lt.Gen.(Rtd) Dr.V.J.Sundaram, Micro & Nano Systems, NDRF
2. Prof.N.Chari, Biomimicking Programmes, NDRF
3. Dr.Abhishek, IIT, Kanpur
4. Dr.Parag Deshpande, MAV Unit, NAL
5. Dr.Arjun Singh, Sakthi Aviation
6. Prof.P.Laxminarayana, NERTU, OU
7. Dr.A.Uma, CBT, IST, JNTUH
8. Prof. KMR Acharya, MRCET

#### Registration Fee (INR) :

**For Full Time PG/Ph.D students :** Rs. 1500/-

**Faculty members :** Rs. 1500/-

**For Scientists and Engineers :** Rs. 3000/-

**18% GST will be extra.**

**DD/Cheque should be drawn in favor of**

**Coordinator, Bio-mimicking Or online payment through**

**NEFT to Coordinator, Bio-mimicking**

**A/C No.:** 37987004918

**IFSC Code:** SBIN0021008

**JNTUH Campus Branch, State Bank of India, Kuakpally**

**Registration Starts from :** 05<sup>th</sup> October 2018

**Last Date for Registration:** 24<sup>th</sup> October 2018

#### COORDINATORS:

**Dr.A.Uma, Head, Center for Biotechnology, IST, JNTUH**

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**Prof.P.Laxminarayana, Director, NERTU, OU**

Ph. 0949 080 5486, [laxminarayana@osmania.ac.in](mailto:laxminarayana@osmania.ac.in)

**For Schedule, Other Details please contact**

#### CO-COORDINATORS, BMAV-18

**Dr. S. Aliya, CBT, IST, JNTUH**

Ph. 09885520755, [biotechaliya@gmail.com](mailto:biotechaliya@gmail.com)

**Ch.Srinu, Research Scholar, NERTU, OU,**

Ph. 0903 293 0657, [sreenu471.ece@gmail.com](mailto:sreenu471.ece@gmail.com)

#### About The Course

Some Insects, Birds and Bats are migrating by travelling more than thousands of kilometers from one continent to another continent due to adverse environmental conditions at home for living. Orientation and Navigation is essential for migration for long distance flight. Long distance flight is the natural phenomena for some birds, insects and bats. These fliers not only migrate to known far away locations, but also navigate for food in the near by area. But the scientists and engineers are yet to understand the orientation and navigation by these fliers and adopt it in the design of bio-mimicking aerial vehicles.

This long distance flight requires abundant supply of energy. Small or big birds are able to make a long distance flight in their annual cycle. Energy requirements of these natural fliers come from oxidation carbohydrates, proteins and mostly from fats. These fliers are using this limited available energy for developing aerodynamic forces such as vertical lift against gravity and forward thrust against drag. All these natural flyers use flapping wings for developing aerodynamic forces. Landing and take off is another challenging problem for bio-mimicking aerial vehicles.

Scientists and engineers have been working for more than two decades to mimic the natural fliers in order to develop bio-mimicking aerial vehicles with autonomous navigation and flapping flexible wings. It requires multidisciplinary expertise from biological and engineering fields. It will be a long way to develop a bio-mimicking aerial vehicle with autonomous navigation and flapping flexible wings for a long distance flight with proper landing and take off mechanisms as in birds.

**The main objective of this course is to bring scientists, engineers, academicians and research scholars on one platform, to work for development of bio-mimicking aerial vehicles. The course will have invited lectures.**

The course will cover the following topics: Navigation by Biological Flyers; Classical Navigation in Man Made flyers; Biomimicking/Autonomous Navigation: Case studies; Migration of Biological flyers; Migration and Energy Requirements; Bio Aerodynamics and Flapping Flexible Wings; Flappers and Flexible Wings for BMAVs; MAVs and UAVs.

**This course is open to all scientists, engineers, academicians and research scholars, who are interested to know the recent trends in this area and planning to work in this area.**

**For schedule and other details visit <http://jntuhist.ac.in> or [www.osmania.ac.in](http://www.osmania.ac.in) or <http://www.uceou.edu>. Interested candidates can download the registration form and send the filled form to the following address along with DD/Cheque, before 24<sup>th</sup> October 2018, to "The Coordinator, BMAV-18, Center for Biotechnology, Institute of Science and Technology, Jawaharlal Nehru Technological University Hyderabad, 500085" or send it by email to [biotechaliya@gmail.com](mailto:biotechaliya@gmail.com), [sreenu471.ece@gmail.com](mailto:sreenu471.ece@gmail.com) and [nertu.courses@osmania.ac.in](mailto:nertu.courses@osmania.ac.in)**

#### ABOUT CENTER FOR BIOTECHNOLOGY, INSTITUTE OF SCIENCE AND TECHNOLOGY, JNTUH

Jawaharlal Nehru Technology University Hyderabad, situated at Kukatpally, Hyderabad was established in 1972. The Institute of Science & Technology (IST), a constituent unit of JNTUH is presently offering Post graduate programmes in interdisciplinary areas of Science & Technology. Some of the areas include Biotechnology, Chemical Engineering, Environment, Geospatial Technologies, Nanotechnology, Pharmacy and Water resources. The Centre for Biotechnology (CBT) was established in 1989 with the aim of generating well trained manpower in different areas of Biotechnology to cater to the needs of industry and research. The faculty members of the centre are actively involved in teaching and research. Some of the areas of research at the centre include Secondary Metabolite production, Cancer Biology, Biofuels and Microbial enzymes. CBT has executed 22 sponsored and consultancy projects funded by MNRE,UGC,AICTE,TEQIP-II & III, DBT,INDO-US- IUUSTF and HPCL. It has conducted nearly Sixty workshop/conferences on topics related to Biotechnology.

#### ABOUT NERTU, OU

The Research and Training Unit for Navigational Electronics (NERTU) is established in 1982. It is the focal point for research and training in the areas of Electronic Navigation in India. It is the first University centre to work in the area of Global Positioning System (GPS) and GPS Aided Geo Augmented Navigation (GAGAN) System. Since its inception, NERTU has been conducting almost one or two short term courses per year in the area of GNSS, since 1992. Scientists, engineers, academicians and research scholars from many organisations have participated and benefited from these courses. There was very good participation in the GNSS -14, 15, 16 and 17, from many Industry, R&D and Academic institutes spread throughout India. NERTU has successfully **executed 60 sponsored and consultancy projects** funded by DRDO, ISRO, DST, MIT, ECIL, HAL, BEL, AICTE and ASL. It has also conducted **65 short term courses/workshops/conferences** on various topics of signal processing, communications and navigation.

## 3-DAY Short Workshop on Migration, Navigation and Biomimicking Aerial Vehicles

Center for Biotechnology, Institute of Science and Technology, JNTUH, Hyderabad – 500085

Collaboration (Technical) with

Research and Training Unit for Navigational Electronics, Osmania University

Hyderabad-500007

### TENTATIVE SCHEDULE

<b>Day-1</b> <b>Thu</b> <b>Nov. 1,</b> <b>2018</b>	0930-1030	1030-1130	11.30- 2.00	1200-1300	13.00- 14.00	1400-1500	15.00 15.30	1530-1630	1630-1730
	Registration & Inaugural Function	Keynote Address  Lt.Gen. (Rtd) Dr.V.J .Sundaram	Tea	Migration of Biological flyers  Prof.N.Chary NDRF	Lunch	Classical Navigation in Man Made Flyers  Dr.Arjun Singh Sakti Aviation	Tea	Navigation by Biological Flyers  Prof.P.Laxminarayana NERTU, OU	Classical Navigation in Man Made Flyers  Dr.Arjun Singh Sakti Aviation

<b>Day-2</b> <b>Fri</b> <b>Nov. 2,</b> <b>2018</b>	0930-1100	11.00 11.30	1130-1300	13.00- 14.00	1400-1500	15.00 15.30	1530-1630	1630-1730
	Bio Aerodynamics Lift, Thrust and Stall Generation	Tea	Basics of Design and Development of UAVs and MAVs	Lunch	Fluid-Structure Interaction in Bird- like Flexible Flapping Wing: An Experimental Study	Tea	Design and Development of UAVs and MAVs at IITK	UAV Design Approach and Wind Tunnel Characterization of a UAV
	Prof.N.Chari, NDRF		Dr.Abhishek, IITK		Dr.Parag, NAL		Dr.Abhishek, IITK	Dr.Parag NAL

<b>Day-3</b> <b>Sat</b> <b>Nov. 3,</b> <b>2018</b>	0930-1030	1030-1130	11.30 12.00	1200-1300	13.00 4.00	1400-1500	15.00 15.30	1530-1630
	Meeting Energy Requirements during Migration	Biomimicking Autonomous Navigation: Case studies	Tea	Review on mathematical Models for Wing beat Frequency of Insects	Lunch	Presentations by PhD Research Scholars and Students	Tea	Concluding Session
	Dr.A.Uma CBT, JNTUH	P.Laxminarayana NERTU, OU		Dr.KMR Acharya, MRCET				

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**Registration Form**

1. Name			
2. Designation/Class			
3. Organization with Address			
4. Educational Qualifications			
5. Professional Experience a. Teaching (Years) b. Research/Industry (Years)			
6. Areas of Research Interest/Working			
7. Email		Can it be shared with participants	Yes/No
8. Phone		Can it be shared with participants	Yes/No
9. Registration fee a. Amount  b. Cash/NEFT/DD/Cheque No.			

Signature of the Candidate with date

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