ASHISH UPADHYAY

- Dear Colleagues, when I read the matter being presented below after completely writing it, I found that it is full of a letter "I". I found no other way of presenting the details and have tried to minimize use of "I". Still it is inherent that where ever this letter is used it is with the understanding that the narration is based on and includes hard work of my students, teachers , collaborators and my friends. I was never interested in any kind of election, however I am assured by some of my respected colleagues and friends that this is going to be a friendly competition. Please allow me to present some facts.

- I am currently working as Associate Professor in Department of Mathematics IIT Patna and I also look after Faculty Affairs of the institute as its Associate Dean (Faculty Affairs). I completed my PhD in the year 2005 from Indian Institute of Science working under the supervision of Professor Basudeb Datta. I received my basic training in Mathematics from Prof B L Sharma and Prof Ramji Lal during my student days in University of Allahabad. Thus I inherit Mathematical legacies of Henry Cartan, Subhashis Nag and Clifford John Earle, Jr. At the core I am a topologist however, due to my very bright PhD students, my current research interest also includes study and construction of codes over finite commutative and non commutative rings, algebraic and spectral graph theories, topological graph theory apart from combinatorial topology and geometry.

- I think I have made some important contributions to the subject, few of which are listed below:

1. Completely classified all the equivelar maps on the double-torus. [A]

2. Initiated a concept called `Semi Equivelar maps' studied for the first time.[B, C]

3. It is widely known that equivelar maps do not exist on the surface of Euler characteristics - 1, however I could classify all the Semi equivelar maps on this surface with few vertices[D]

4. Using this answered in affirmative a question posed by Negami and Nakamoto. [E]

5. Found a necessary and sufficient condition for existence of contractible Hamiltonian cycles in edge graphs of surfaces and polyhedral maps. [F, G]

6. Presented an algorithm which searches for such cycles. [G]

7. In [H], gave a partial solution to Grunbaum's Conjecture.

- References:

A. Forum Mathematicum, vol 18, issue 6, pp-1011-1026

B. Beitrage zur Algebra und Geometrie , 55(1), 229-242

C. Math. Slovaca , 67(2), pp. 519-532

D. Note Mat. 37 no. 2, 91-102

E. Graphs and Combinatorics (to appear),

F. Elemente der Mathematik, 69(1), 23–29

G. Proc. Indian Acad Sc.(Math. Sc.), 127, 737 − 751

H. Contributions to Discrete Mathematics, 13, 79 − 119

- We are now using spectral techniques in graph theory to look at Hamiltonicity of 4 connected toroidal graphs (this is related to a long standing problem called Grunbaum's conjecture). There are many more such works in the pipeline. Of course, the above mentioned works are with my collaborators and students.

- Association with Students

As one can also see from my profile on IIT Patna web-page, I have two PhD students who completed their thesis working with me. Currently five more PhD students are currently working with me in the areas of Algebraic graph theory, Combinatorial Topology, Coding theory over finite commutative and non commutative rings and spectral graph theory. These students are in various stages of completion of their PhD degree. In addition to this I am also working with MSc students on three projects namely: i. Coxeter groups, ii. Computational Geometry and iii. Riemann Surfaces. I have already guided one M.Tech thesis on the topic related to extracting information about combinatorial manifolds using

persistence homology, Two students have also completed their MSc thesis working with me. The topics of their study was: 1. Triangulations and 2. Shape of Space, respectively. I have guided few summer interns too.

- Teaching

As far as my contribution to Mathematics education goes I have designed and floated Under graduate and post graduate courses on 1. Graphs, Groups and Networks, 2. Introduction to Computational Topology, 3. Geometric and Topological modelling for Scientists and Engineers. Apart from these courses I teach courses in topics such as Differential Geometry, Algebra, Calculus, Graph Theory, Measure Theory and almost all the basic courses at under graduate level.

- I have successfully completed a project on d-covered triangulations (questions involving degrees of graphs) and semi equivelar maps(combinatorial structures on 2-manifolds) funded by Government of India.

- Professional activities

- I have delivered invited talk in Vanderbilt University in conference on Cycles in Graphs. I have also delivered several invited talks on topics related to to my area of research in prestigious forums. I have been reviewer for several national and international journal, PhD thesis, MTech thesis and research projects, a reviewer of MathSciNet and Zbl. I have had opportunity of being part of selection committees, board of studies and board of examiners.

- I have been able to organize some workshops and training programs in IIT Patna, the funds came from sources such as Indian Academy of Sciences, DST, NCM and NASI. I have served in various administrative capacities such as coordinator(same as head of dept) of my department, member of academic senate and I am currently serving as associate dean of faculty affairs for my institute. I have also served on the regional program committee of Ramanujan Math Society and on the NBHM library committee for North Central region.

- On RMS

I am a member of RMS since the year 2005 and have been participating in its activities regularly since then. That July in 2005 the Annual conference of RMS was held in University of Calicut under the Presidentship of Prof R Parimala. Prof V Krishna Kumar was local organizer/convener. Since then the society has grown and I am sure it will grow further vertically. I have been with the society for long and support all its major activity. I am young and still when I look around me in contemplation, I find that some parts of the country have remained mathematically unattended. The culture, the joy and the pursuit of good Mathematics has somehow not been able to infect/reach the common BSc, MSc, PhD students and college teachers of these regions. Current situation is grim. I am actually mentioning regions encompassing Bihar, Jharkhand, Chattisgarh and Madhya Pradesh. I am comparatively more familiar with these regions and my experience (whatever small) says that it is long since some good Mathematics has come out of these regions. It is here that RMS can make a difference. Apart from actively participating in the activities of RMS, I would try that the society makes a major impact in changing the current scenario for good. I have plans for it in mind but that is for some other time to discuss.