

J.S.S. BANASHANKARI ARTS, COMMERCE AND SHANTIKUMAR GUBBI SCIENCE COLLEGE, VIDYAGIRI, DHARWAD

Affiliated to Karnatak University, Dharwad

Accredited with 'A' Grade in last three cycles



Fourth Cycle NAAC Accreditation SELF STUDY REPORT (SSR)

≡ CRITERION - III ≡

3.2.2 (Q_nM)

Number of workshops/seminars conducted on
Research Methodology, Intellectual Property Rights (IPR)
and entrepreneurship during the last five years

Photonics and its Applications



Submitted to
NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL, BENGALURU

ಜನತಾ ಶಿಕ್ಷಣ ಸಮಿತಿಯ

ಬನಶಂಕರಿ ಕಲಾ, ವಾಣಿಜ್ಯ ಮತ್ತು
ಶಾಂತಿಕುಮಾರ ಗುಬ್ಬಿ ವಿಜ್ಞಾನ ಮಹಾವಿದ್ಯಾಲಯ
ವಿದ್ಯಾಗಿರಿ, ಧಾರವಾಡ-೫೮೦ ೦೦೪.

JSS



Janata Shikshana Samiti's

**BANASHANKARI ARTS, COMMERCE AND
SHANTIKUMAR GUBBI SCIENCE COLLEGE,
Vidyagiri, Dharwad-580 004.**

Ph.: (0836) 2468478, Fax : (0836) 2462200
E-mail : principaljsscollegedwd@gmail.com

ನ್ಯಾಕ್ ಸಂಸ್ಥೆಯಿಂದ 'A' ಗ್ರೇಡ್ ಪುನರ್‌ಮಾನ್ಯತೆ
ಯು.ಜಿ.ಸಿ. ಯಿಂದ 'CPE' ಮಾನ್ಯತೆ

Reaccredited at the 'A' level by NAAC
"College with Potential for Excellence" recognition by UGC

Ref. No. JSSCD/

Date : 19-09-2016

Report on Two days National Level Seminar on Photonics and its applications

J.S.S' Banashankari Arts, Commerce, and Shantikumar Gubbi Science College, Dharwad organised Two days UGC sponsored Seminar on "Photonics and its applications" on 16th and 17th September 2016. The programme was begun at 10AM with welcome address.

The Seminar was focused on the research areas of photonics and its applications in the fields of physics, engineering, biotechnology, nanotechnology and biomedical engineering. The seminar also emphasised the applications of photonics in laser technology and aerodynamics.

The resource persons were Prof. Santosh Chidangal, Prof. J S Bhat, Prof. Uday Raikar, Dr. Vikas M Shirle, and K. S. Choudari.

About 120 delegates participated in seminar. Dr. B.Gayatri was the convenor of seminar, Badesab Killedar was the organizing secretary.


Principal

PRINCIPAL
J.S.S. Banashankari Arts, Commerce &
Shantikumar Gubbi Science College.
- DHARWAD-580 004.





3.2.2
विश्वविद्यालय अनुदान आयोग
नैरुत्य प्रादेशिक कार्यालय
UNIVERSITY GRANTS COMMISSION
SOUTH WESTERN REGIONAL OFFICE
P.K. Block, Palace Road, Gandhinagar
Bangalore-560 009.
Phone : (080) 2228 0380 Fax : (080) 2228 0381

SEM-1183/14-15/KAKA060/UGC-SWRO/(PHYSICS)

The Principal
JSS'S BANASHANKARI ARTS, COMMERCE & SKG SCIENCE. COLLEGE
DHARWAD - 580 004

10-Apr-15

Sub: Transfer of funds to Colleges through RTGS/NEFT

Sir/Madam,

This has reference to this office Sanction letter No. SEM-1183/14-15/KAKA060/UGC-SWRO/(PHYSICS) dated 31-Mar-2015 sanctioning therewith an amount of Rs.64000/- under the scheme of Seminar/Workshop/Conference/Symposium.

The above sanctioned amount has been transferred to your college Account No.12382010009537 with IFSC code: SYNB0001238 through RTGS/ NEFT.

The CANARA BANK, CUNNINGHAM ROAD, BANGALORE (CNRB0000431) has confirmed the above transfer of funds to your college through RTGS/NEFT vide confirmation number P15041025493906 on dated 10-Apr-2015

You are requested to confirm the receipt of the above amount in your account by sending back the enclosed stamped receipt(colour paper). Further grants to the college will depend on receipt of this acknowledgement within ten days.

Yours faithfully,

M. G. G. G.
Deputy Secretary

- Encl. 1. Sanction letter
2. Acknowledgement

To,
Principal
BH
14/5/15



No. 3966



विश्वविद्यालय अनुदान आयोग

नैरुत्य प्रादेशिक कार्यालय

UNIVERSITY GRANTS COMMISSION

SOUTH WESTERN REGIONAL OFFICE

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Phone : (080) 2228 0380 Fax : (080) 2228 0381

31-Mar-15

SEM-1183/14-15/KAKA060/UGC-SWRO/(PHYSICS) - विज्ञान विमुक्तये

The Accounts Officer
South Western Regional Office
University Grants Commission
P.K. Block, Palace Road
Gandhinagar, Bangalore

Sub: Release of Grants-in-aid to JSS'S BANASHANKARI ARTS, COMMERCE & SKG SCIENCE. COLLEGE, DHARWAD, for the year 2014-2015 under (Plan) entitled PHOTONICS AND ITS APPLICATIONS

Sir/Madam,

I am directed to convey the sanction of the University Grants Commission for payment of grant of Rs.64000/- as first installment for the year 2014-2015 to JSS'S BANASHANKARI ARTS, COMMERCE & SKG SCIENCE. COLLEGE, DHARWAD, to organise the aforesaid event under Seminar/conference/Workshop/Symposium(Plan) expenditure to be incurred during 2014-2015.

NAME OF ITEM	AMOUNT ALLOCATED	Grant now being Sactioned	Grant already Sactioned	Total Grant	BALANCE
1. Resource Person TA/Hon.	40,000	32,000	0	32,000	8,000
2. Paper Presenters TA.	0	0	0	0	0
3. Pre-conference printing	10,000	8,000	0	8,000	2,000
4. Publication of Proceedings.	10,000	8,000	0	8,000	2,000
5. Local Hospitality.	20,000	16,000	0	16,000	4,000
TOTAL	80,000	64,000	0	64,000	16,000

Head of Account	3(A)2202.03.102.10.01.31(UGC Schemes)	3(B)2202.03.789.03.01.31(Special component to SC)	3(C)2202.03.796.03.01.31(Special component to ST)
Grant-in-aid General (31)	49600	9600	4800

The sanctioned amount is debitale to 3(A)2202.03.102.10.01.31(UGC Schemes),3(B)2202.03.789.03.01.31 (Special component to SC),3(C)2202.03.796.03.01.31(Special component to ST) (GENERAL - 31) and is valid for payment during the financial year 2014-15 only.

- The amount of the Grant shall be drawn by the Accounts Officer/Drawing and Disbursing Officer, South Western Regional Office, UGC, Bangalore on the Grants-in-aid bill and shall be disbursed to and credited to the Principal of the College through Electronic mode as per the following details:
 - Details (Name & Address) of Account Holder: JSS'S BANASHANKARI ARTS, COMMERCE & SKG SCIENCE. COLLEGE, DHARWAD,
 - Account No: 12382010009537
 - Name & adress of Bank branch: SYNDICATE BANK, JSS COLLEGE CAMPUS,VIDYAGIRI, DHARWAD-580004
 - MICR Code: 580025303
 - IFSC Code: SYNB0001238
 - Type of Account: SB
- The grant is subject to the adjustment on the basis of utilisation certificate in the prescribed proforma submitted by the College.
- The college shall maintain proper accounts of the expenditure out of the grants which shall be utilised only on approved items of expenditure.
- The College may follow the General Financial Rules, 2005 and take urgent necessary action to amend their manuals of financial procedures to bring them in conformity with GFRs, 2005 and those don't have their own approved manuals on financial procedures may adopt the provisions of GFRs, 2005 and instructions/guideline there under from time to time.
- The Utilization Certificate to the effect that the grant has been utilized for the purpose for which it has been sanctioned shall be furnished to UGC as early as possible after the close of current financial year.
- The assets acquired wholly or substantially out of University Grants Commission's Grant shall not be disposed or encumbered or utilised for the purposes other than those for which the grant was given without proper sanction of the UGC and should at any time the College ceased to function, such assets shall revert to the University Grants Commission.
- A Register of Assets acquired wholly or substantially out of the grants shall be maintained by the College in the prescribed proforma.

Contd.2

Principal
J.S.S. Banashankari Arts, Commerce &
Santikumar Gubai Science College,
DHARWAD-580 004.

10. The grantee institution shall ensure the Utilization of grants-in-aid for which it is being sanctioned/paid. In case of non-utilization/part utilization thereof, the simple interest @ 10% per annum as amended from time to time on unutilised amount from the date of drawal to the date of refund as per provisions contained in General Financial Rules of Govt. of India will be charged. The refund of unspent grant in aid / or interest , if any, be credited in following UGC account through e-mode (RTGS/NEFT) under intimation to this office
Name of the Bank : Canara Bank, Cunningham Road, Bangalore / Account No.: 0431101033961
Type of Account : Saving Bank / IFSC Code : CNRB0000431 / MICR Code : 560015014
Holder of Account : University Grants Commission, Bangalore
11. The College shall follow strictly the Government of India/UGC's guidelines regarding implementation of the reservation of policy [both vertical (for SC, ST and OBC) and horizontal (for person with disability etc.)) in teaching and non-teaching posts.
12. The College shall fully implement the Official Language Policy of Union Govt. and comply with the Official Language Act, 1963, and Official Languages (Use for Official Purposes of the Union) Rules, 1978 etc.
13. The sanction is issued in exercise of the delegation of powers vide UGC office order No.69/2014[F.No.10-11/2012(Admn.1AB)] dated 26/3/2014.
14. The College shall take immediate action for its accreditation by National Assessment and Accreditation Council (NAAC).
15. The accounts of the College will be open for audit by the Comptroller and Auditor General of India in accordance with the provisions of General Financial Rules, 2005.
16. The annual accounts i.e. balance sheet, income and expenditure statement and statement of receipts and payments are to be prepared strictly in accordance with the Uniform Format of Accounting prescribed by the Government.
17. The funds to the extent are available under the Scheme.
18. This issues with the approval of UGC vide diary no dated As revalidated by Chairman, UGC for the financial year 2014-15 vide diary no..... dated
This issues with the concurrence of IFD and approval of Secretary vide UGC-IFD Diary No.11416 and dated 25-Mar-2015.
19. An amount of Rs nil out of the grant of Rs.nil sanctioned vide letter No.SEM-1183/14-15/KAKA060/UGC-SWRO/(PHYSICS) dated nil has been utilized by the College for the purpose for which it was sanctioned and noted in Grants-in-aid Register at Page No.—
20. The grant is sanctioned on the basis of the information/documents provided by the college. In case of any discrepancy in the above information and the college is found ineligible for the above grant at the time of expert committee meeting the college is liable to refund the sanctioned grant along with interest.
21. The college shall ensure involvement of Technical advice on and supervision of specifications and construction standards.
22. College should abide by the UGC Regulation on curbing the menace of ragging in the Higher Educational Institution 2009, and shall take action in accordance with these regulations against those found guilty of ragging and/or abetting ragging actively or passively or being part of a conspiracy to promote ragging.

Yours faithfully

(Dr.N. Gopukumar)

Deputy Secretary

Copy to

✓ The Principal

JSS'S BANASHANKARI ARTS, COMMERCE & SKG SCIENCE.
COLLEGE

DHARWAD - 580 004

(He/She is requested to abide by these instructions/guidelines of sanction order.)

2. Officer of Director General of Audit, Central Revenues,
AGCR Building, I.P. Estate, New Delhi

3. The Commissioner

Department of Collegiate Education
Government of Karnataka, Bangalore -

4. The Dean/Director, College Development Council

KARNATAK UNIVERSITY

PAVATE NAGAR
DHARWAD - 580 003

5. Office copy



(Dr.S. Salil)
Education Officer



**J.S.S. BANASHANKARI ARTS, COMMERCE & S.K. GUBBI
SCIENCE COLLEGE, VIDYAGIRI, DHARWAD-580004.**

(Affiliated to Karnatak University)


Re-accredited at the 'A' level by NAAC 'CPE' (2nd Phase) Recognition by UGC

A REPORT ON

**Two days National Level Seminar on
Photonics and its applications.**

SPONSORED BY

**University grants commission
NEW DELHI.**


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Shantikumar Gubbi Science College,
DHARWAD-580 004.

Registration fees:

1. Faculty Rs. 500/-

2. Students/ Research Scholars Rs. 200/-

The registration fee is to be paid in the form of DD drawn in favour of Principal, J.S.S. College, Dharwad.

Last date for registration: 12th September 2016.

Registration fees shall be paid in cash on 16th September 2016.

Note: Two staff members and Six students from each College can participate.

No TA/DA will be paid to the participants.

Accommodation for outstation participants will be arranged on request at their own cost.

Contact : Prof. T.M. Shridhar M : 9341171071



Chief Patrons : **Pujya Sri. Vishweshateertha Swamiji**, Pejawar Math, Udipi, President, Janata Shikshana Samiti, Vidyagiri, Dharwad.

Padmabhushana Pujya Dr. D. Veerendra Heggade, Dharmasthala, Chairman, Janata Shikshana Samiti, Vidyagiri, Dharwad.

Dr. N. Vajrakumar, Secretary, Janata Shikshana Samiti, Vidyagiri, Dharwad.

Patrons : **Dr. Ajith Prasad**, Finance officer, J.S.S. Group of Institution Vidyagiri, Dharwad.

Shri. Suraj Jain, Development officer, J.S.S. Dharwad.

Local Organizing Committee:

Chairman : **Dr. G. Krishnamurthy**, Principal, JSS College, Dharwad.

Convener : **Dr. B.R. Gayathri**, Head, Dept. of Physics.

Organizing Secretary : **Dr. K. Badesab**, Associate Professor

Members :
Dr. K. H. Nagachandra
Shri. S.S. Shanwad.
Shri. I.I. Nadaf
Shri. T.M. Shridhar
Shri. B.I. Aldi.
Miss. Triveni Hiremath.
Mrs. Shweta Kore.

For details, contact : **Dr. K.H. Nagachandra**
Mob. No: 9448837111
Shri. I. I. Nadaf
Mob. No: 986982686.

E-mail: physics.jss@gmail.com



JSS



J.S.S. Banashankari Arts, Commerce & Shanti Kumar Gubbi Science College, Vidyagiri, Dharwad -580004.

Reaccredited at the 'A' level by NAAC
"College with Potential for Excellence" recognition by UGC



National level seminar on "Photonics and its Applications"

Organized by :
Department of Physics

Sponsored by :
University Grants Commission- New Delhi 12th Plan

Date: 16th and 17th September, 2016.
Venue: Utsav Hall, J.S.S. College, Dharwad.

Inauguration : 10.00.AM on 16th September, 2016.

All are cordially invited

Tel: 0836-2468478. Fax: 0836-2462200.
Website: www.jsscollegedharwad.org
E-mail: principaljsscollegedwd@gmail.com

About JSS College:.....

Janata Shikshana Samiti's Banashankari Arts, Commerce and Shantikumar Gubbi Science College more popularly known as "JSS College" was established in the year 1944 by Karnataka Education Board. Science wing was added in the year 1949. Later in 1952, it was taken over by Late **Shri. R.S. Hukkerikar**, the veteran freedom fighter and an educationalist. Subsequently, it was handed over to **Sri Vishweshateertha Swamiji** of Pejavar Math, Udupi, who requested Padmabhushan **Dr. D. Veerendra Heggade**, Dharmadhikari, Srikshetra Dharmasthala to take over the reins of the Samiti. Being Secretary, **Dr. N. Vajrakumar** was entrusted with the task of developing JSS institutions and he became the principal of the institutions also. **Dr. Ajith Prasad** is finance officer of the samiti.

With their administrative foresight JSS College flowered, flourished and fostered as a new center of learning. JSS College is now considered as one of the pioneer and the most prestigious colleges in North Karnataka. The college is affiliated to Karnatak University, Dharwad. During the academic year 2004-05, it has been accredited with 'A' Grade by NAAC and again reaccredited with 'A' grade in 2010.

College with Potential for Excellence by UGC in 2010 and presently continued with CPE phase – II. The college has also received UGC grant for infrastructure development for 10 aided departments at the rate of 5 lakh for each department. Also, Vision Group of Science and Technology (VGST) has awarded Centre of Innovative Science Education to our college for the period 2010-13 for the establishment of quality teaching aids, improving science laboratories and research activities. The college is having 3 UG courses and 3 PG departments including Physics.

The NAAC peer team has visited during last week of July for third cycle assessment and institution expecting more than 'A' grade. Presently, **Dr. G. Krishnamurthy** is the Principal of the College.

About the Department :

Department of Physics was established in the year 1949, with a view to impart the quality Science education to the poor, rural and urban students. The department has research oriented well experienced faculty. Our faculty members are attending seminars,

workshops and conferences for the betterments. The department conduct guest lecturers by eminent scholars in field as apart of curriculum. The department is enriched with a spacious and independent Laboratory consisting of high quality apparatus. Post Graduation in Physics was introduced in the year 2014-15 with intake capacity of 40 students and now the intake capacity is increased to 60 students. Condensed matter physics and Nuclear physics are the specialization subjects for the final year.

Objectives of the seminar:

- The seminar on "Photonics and its Applications" will make the participants to gain knowledge on the current trends in scientific research on photonics and inspire many of them to pursue research.
- The seminar will throw light on the fields of research which may be chosen by young teachers from the participating colleges.
- The extended interaction with experts will motivate students to grow as scientists for doing research in the frontiers of Science and technology.

5.2.11

Two days National Level Seminar on Photonics and its applications.

SPONSORED BY

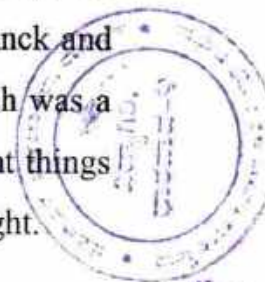
University grants commission – NEW DELHI.

Introduction to photonics:

It was only in the 17th century that Sir Isaac Newton showed that white light is made of different colors of light. At the beginning of the 20th century, Max Planck and later Albert Einstein proposed that light was a wave as well as a particle, which was a very controversial theory at the time. How can light be two completely different things at the same time? Experimentation later confirmed this duality in the nature of light.

The word *Photonics* appeared around 1960, when the laser was invented by Theodore Maiman. Photonics is an area of study that involves the use of radiant energy (such as light), whose fundamental element is the photon. Photonic applications use the photon in the same way that electronic applications use the electron. Devices that run on light have a number of advantages over those that use electricity. Light travels at about 10 times the speed that electricity does, which means (among other things) that data transmitted photonically can travel long distances in a fraction of the time. Furthermore, visible-light and infrared (IR) beams, unlike electric currents, pass through each other without interacting, so they don't cause interference. A single optical fibre has the capacity to carry three million telephone calls simultaneously. Among the large number of current or possible photonic applications are: photonic switching, silicon photonics, photonic networks, and the photonic computer.

On the most fundamental level through photosynthesis, light is necessary to the existence of life itself, and the many applications of light have revolutionized society



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through medicine, communications, entertainment and culture. Light and photonics are poised to become key enabling technologies of the future. Photonics is the science of light. It is the technology of generating, controlling, and detecting light waves and photons, which are particles of light. The characteristics of the waves and photons can be used to explore the universe, cure diseases, and even to solve crimes. Scientists have been studying light for hundreds of years. The colors of the rainbow are only a small part of the entire light wave range, called the electromagnetic spectrum. Photonics explores a wider variety of wavelengths, from gamma rays to radio, including X-rays, UV and infrared light. Photonics underpins technologies of daily life from smart phones to laptops to the Internet to medical instruments to lighting technology. The 21st century will depend as much on photonics as the 20th century depended on electronics.

Even if we cannot see the entire electromagnetic spectrum, visible and invisible light waves are a part of our everyday life. Photonics is everywhere; in consumer electronics (barcode scanners, DVD players, remote TV control), telecommunications (internet), health (eye surgery, medical instruments), manufacturing industry (laser cutting and machining), defense and security (infrared camera, remote sensing), entertainment (holography, laser shows), etc.


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Shantikumar Gubbi Science College,
DHARWAD-580 004



Two days National Level Seminar on Photonics and its applications was organized by the Department of Physics JSS Banashankari Arts, Commerce and S.K Gubbi Science College on **16th and 17th September 2016**. The staff members of the department competently organized the programme, by contacting the resource persons suitable for the theme and title of the programme.

As per the guidelines of the University grants commission –New Delhi, wide publicity was given for the programme. The invitation comprising all the details of the programme was prepared in accordance with guidelines of U.G.C along with brochure was sent to all Science Colleges in Karnatak State and outside Karnataka also and they were informed to send five students and two staff members to participate from each college in the seminar. In response to our invitation, nearly **30** staff members and **150** students from different colleges including our students & staff were attended the seminar.

In view of the topic given for the seminar, it was decided to invite National level scientists working in different institutions of India. One of the internationally known scientist, **Prof. Santhosh Chidangil**, Head of the department of Atomic and molecular Physics from Manipal University, Manipal have accepted our invitation and he gave one special lecturer on **Photonics techniques on biomedical applications** on 16th September 2016. He was also the chief guest of the inaugural function. In the absence of Dr.N.Vajrakumar, the secretary of the JSS institution, the chief guest of the function **Prof. Santhosh Chidangil inaugurated two days National Level Seminar**. Dr.G.Krishnamurthy, Principal of the College was the President of the inaugural function. On the same day **Prof. J.S.Bhat** from Karnatak University gave one lecture on the topic **Photonics and its applications** followed by **Dr. Vikas M. Sherle**, Assistant professor from Ramaiah University of Applied Sciences delivered a special lecture on **LIF and PLIF applications in aerospace**. Next day on 17th September 2016, **Shri. K.S.Choudhari**, Assistant Professor, Atomic and Molecular Physics, Manipal University, Manipal took first session on **Nanostructures in photonics**. Later, it was followed by **Dr. Suresh. D. Kulkarni**, Associate Professor from Manipal University, Manipal gave a special lecture on **Light emitting materials: Multitude applications**.

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J.S.S. Banashankari Arts, Commerce &
Shantikumar Gubbi Science College

In the afternoon, **Prof. Uday S. Raikar** from Karnatak University, Dharwad gave a special lecture on **Photonic Sensors**. At the end of two days seminar, the programme was concluded on 17th September evening by conducting **Valedictory function**. In the valedictory function, **Prof. Uday S. Raikar** was the **chief guest** and in the absence of Principal Dr. G.Krishnamurthy, **Dr. S.V.Gudi** the Vice Principal of the College was the **president** of the function. Two of the student participants and shared their feedback about the entire programme. Vice Principal of the College **Dr. S.V.Gudi** gave his presidential remark at the end.

The participants were elated with the information they perceived from the resource persons. Students and staff members interacted with scientists and clarified their doubts. The whole programme was well appreciated by the student participants and the staff members of the colleges including those from other science colleges who attended the programme. For your reference, the feedback forms about two days programme was also attached with this report. The sequence of events was planned such that the students and participants get enough time to interact with the resource persons.


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Shantikumar Gubbi Science College,
DHARWAD-580 604.



Programme schedule

16th September 2016.

9.00AM-10.00AM- Registration and Refreshment.

Session I – Inauguration.

10.00 AM -11.30AM- **Inaugural session.**

11.30AM-1.00 PM – **Session II** - Prof. Santhosh Chidangil.

1PM- 2PM- Lunch break

2PM – 3.30PM- **Session III** - Prof. J.S.Bhat

3.30 PM- 5PM- **Session IV** – Dr. Vikas. M.Sherle.

17th September 2016.

9.30AM-10.30AM –Refreshment

10.30 AM -12PM- **Session V**- Shri. K.S.Choudhari.

12PM-1.30 PM –**Session VI** - Dr. Suresh.D.Kulkarni.

1.30PM- 2.30 PM- **Lunch break**

2.30PM- 4PM- **Session VII** – Prof. Uday. S.Raikar.

Session VIII

4PM- 5PM - **Valedictory function.**



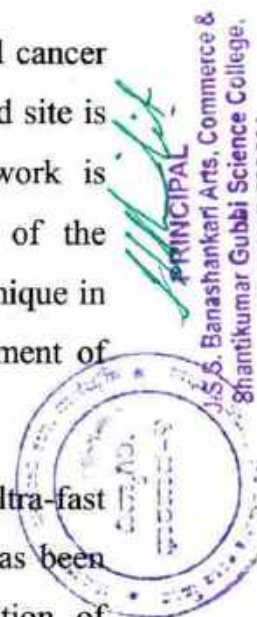
Bio-data of Prof. Santhosh Chidangil.

Prof. Santhosh Chidangil completed his M.Sc. and Ph.D. in Physics from Banaras Hindu University. He started his research career beginning with studies on electronic structure and spectra of molecules of biological importance. Extensive theoretical and experimental analysis of DNA bases and their analogues have been studied in order to understand molecular structure in relation to biological action. Interaction of these systems with environment has also been studied using molecular Spectroscopy. The results were interpreted with the help of rigorous quantum mechanical calculations. Structure- function relationships and conformational analysis of several classes of anti-microbial, anti-bacterial, anti-viral (anti-HIV) drugs, artificial sweeteners etc. have also been studied and models in each categories have been proposed to increase potencies using electro-static and electric field mapping and other molecular modeling techniques.

Prof. Santhosh and his group has designed and developed an in vivo oral cancer screening system in which laser induced fluorescence detected from the affected site is utilized to distinguish cancer with non-cancerous conditions. Now the work is progressing well to develop miniature devices for multicenter evaluation of the technique for the screening of oral cancer using laser induced fluorescence technique in collaboration with Holmarc Machatronics Pvt. Ltd and the support of Department of Science and Technology.

Prof. Santhosh has started a program of investigation of propagation of ultra-fast pulses of intense infrared light through biological macromolecular media. It has been observed that the super continuum in water, generated due to the interaction of femtosecond infrared pulse, is severely suppressed in the presence alpha-amylase, an enzyme, which is a potential stress marker in human saliva. Suppression of super continuum has also been studied in several other serum proteins.

Laser Induced Break down Spectroscopy (LIBS) is well recognized as a promising tool for in situ and remote elemental analysis of environmental, clinical, archeological and hazardous samples. A sensitive, high resolution and broad range laser



induced breakdown spectroscopy (LIBS) system having echelle type spectrometer coupled with an ICCD has been assembled and tested by his group

An optical trap combined with a Raman spectrometer has been developed to study measurements of Raman spectra of optically-immobilized, single, live, red and white blood cells. Raman spectra of RBC recorded using this high sensitivity, dual wavelength apparatus has enabled identification of several vibrational bands; the hitherto-unreported lines originate purely from hemoglobin. Team at Manipal is focusing research using micro-Raman spectroscopy to study interaction of live cells with drugs, nanoparticles, cell-cell, cell-radiation to know the various dynamics associated with these systems.

Protein profiles of body fluids were studied by his group using High Performance Liquid Chromatography (HPLC) separation combined with ultra sensitive laser induced fluorescence (LIF) detection. Protein profile analyses of serum and saliva have shown that HPLC-LIF combined with pattern recognition algorithm is a promising method for the objective diagnosis of oral cancer. The technique is found to be equally useful for the early diagnosis of cervical cancer using serum and cytological smear as test samples.

Prof. Santhosh has established a nanobiophotonics laboratory at Manipal through the support from DST-FIST grant with a research focus on synthesis and characterization of upconversion nanoparticles for optical imaging applications.

Recently, Prof. Santhosh has coauthored a book titled "Biomedical Spectroscopy" published by Manipal University Press is very useful for researchers in the area of biomedical spectroscopy and biomedical engineering. He has completed more than 7 funded research programmes in the area of biomedical spectroscopy and photonics. He has more than 90 publications in National and in International Journals. Currently, he is a Professor and Head of the Department of Atomic and Molecular Physics, Manipal University, Manipal.



Bio data of Prof. J. S. Bhat

Dr. J.S. Bhat former Registrar-Evaluation of Karnatak University, Dharwad had his early education in a village by name Alike in Dakshina Kannada District. He had his Master's degree in Physics from Mysore University in 1980 and then Ph.D. from Karnatak University in 1995. He started his teaching career in 1980 in JCBM College Sringeri, and since 2004 he is professor of Physics in Dept. of Physics, Karnatak University. His fields of research are Theoretical Condensed Matter Physics (nanodevices); Digital Signal Processing and Metal Oxide Thin films (Expt). He has guided 5 students for Ph.D., 6 for M.Phil. He has published 23 papers in international journals and 5 in national journals and has attended many national and international conferences. He has been instrumental in developing the campus area network and computer centre in Karnatak University, computerization of examination section and accounts section of the University. Since 2002 he was assigned with additional responsibility as Director for information technology in Karnatak University till 2011. He has provided consultancy service in designing campus network to Gulbarga University, Kannada University Hampi, and Baahubali Engineering College. From 2010 to 2012 he shouldered the responsibility of managing the examination section of the University as Registrar (Evaluation). During his tenure he streamlined various procedures in the examination section for speedy declaration of results. He had been to Paul Sabatier University in France in 2008 and has visited Hanyang University in South Korea in 2009 under INSA international scientist exchange programme. He is referee for various international journals of repute and member of UGC committee for mid-term evaluation and selection of major research projects during 2013-14. He has been identified as recourse person for DST INSPIRE programme by Govt. of India as well as Karnataka Rajya Vijnana Parishad for popularization of science since 2005. He has given 25 popular lectures in many colleges and institutes on subjects like nanotechnology, signal processing and general science.

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Bio- data of Shri K.S.Choudhari

K.S. Choudhari is working as Assistant Professor Senior Scale, at Department of Atomic and Molecular Physics, Manipal University, Manipal, India. He has been involved in teaching Photonics and Nanoscience and Technology at Masters Level for the last five years. He has completed his Masters in Physics at Karnatak University Dharwad in 2004. He worked as Lecturer at JSS College, Vidyagiri Dharwad for two years for undergraduate Physics teaching. He then worked as a Junior Scientist at Centre for Laser Spectroscopy, Manipal University, Manipal for two years in the prestigious Manipal University-Philips joint project on "Oral cancer screening in rural India" where he worked on early detection of oral cancer using Laser Induced Fluorescence and High Performance Liquid Chromatography-Laser Induced Fluorescence. He has worked as Junior Research Fellow at National Institute of Technology Karnataka Surathkal. He has undergone Hands on Training Program on Nanofabrication Technologies conducted by Indian Nanoelectronics User Group at Indian Institute of Science Bangalore in the year 2010. He joined Department of Atomic and Molecular Physics in 2011. He is currently pursuing his Doctoral studies in the area of nanoporous materials at Department of Atomic and Molecular Physics. His research interests are Biomedical Optics, Laser Spectroscopy and Nanomaterials. He has published more than 15 scientific papers in peer reviewed international journals. He is the reviewer for many international journals published by Royal Society of Chemistry, Elsevier and Wiley Publications. He has presented more than 30 research papers at National and International Conferences. He has successfully guided 4 M.Sc. students in their final semester projects in the field of Photonics and Nanoscience and Technology. He is actively involved in the various research projects going on at the department. He is a life member of Laser and Spectroscopy Society of India.



Biodata of Dr. S.D.Kulkarni

Dr. Suresh D. Kulkarni is a young researcher working in the area of Nanoscience and nanomaterials. His native place is Hubli, where he had his early education and graduated from P. C. Jabin Science College, Hubli. After finishing his M. Sc. he joined for Ph. D. in Chemistry, under the supervision of Prof. S. T. Nandibewoor. Soon after his doctoral work he joined Indian Institute of science, Bangalore in 2008, as Post-Doctoral Research Associate. There he gained expertise on various projects in the area of Nanomaterials. He developed novel and rapid methods of nanomaterial synthesis and processing. Since January 2012. Dr. Suresh Kulkarni joined the Department of Atomic and Molecular Physics, Manipal University, Manipal and is an presently he is an Associate Professor. Some of the responsibilities include, Theory and practical classes to M. Sc. Nanoscience and Technology course apart from ongoing research work. He has set up a low cost Chemical vapor deposition system for thin films. Research work involves the synthesis of functional metal oxide nanoparticles by novel solution methods and the study of their optical and magnetic properties. Besides the synthesis of upconversion nanoparticles for biological applications is also being carried out as a part of DST-FIST project. He has published several papers in peer reviewed journals of international repute and presented his research work in international platforms including the prestigious Fall meeting of Materials Research Society at Boston, USA. He is running two DST funded research projects and has 150 citations and H- index of 7. Presently he is guiding four Ph. D. students. The research interests of Dr. Suresh are

1. Rapid synthesis methods for the preparation of metal oxide nanoparticles
2. Wide band-gap semiconductors for display applications
3. Thin films and coatings
4. Optical properties of Metal Aluminates and related materials
5. Synthesis of upconversion nanoparticles
6. Development of Metal-organic complexes as precursors to nanostructures
7. Rapid Synthesis of Magnetic nanoparticles



Shankit
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Bio-data of Professor U. S. Raikar
Department of Physics
Karnatak University, Dharwad



Dr. U. S. Raikar did his M. Sc. (Physics) from Karnatak University, Dharwad, India. He did his M. Phil (1990) and Ph. D. (1994) from Shivaji University, Kolhapur. His research interests include Fluorescence, Spectroscopy, Green Nanotechnology, optical fiber Spectroscopy and fiber grating sensor. Given invited talks at 15th Radiochemical Conference Marianske Lazne, Czech Republic and International Symposium at Kumamoto University, Japan 3-5 March 2011. Having research projects and research collaborations with IISc (Bengaluru), CUSAT (Kochi), BARC (Mumbai), CAT (Indore). He is reviewer for many international journals. He is editorial member for International journal for Green Nanotechnology, USA.

He has guided 10 Ph.D. and 3 M. Phil and about 87 International / National publications are to his credit. In his 37 years teaching service he worked as lecturer, senior lecturer, senior grade lecturer, and HOD of Physics department at J. T. College Gadag, Karnataka. Joined the Service as a Reader in the Karnatak University, Dharwad, now at present he is professor in the department of Physics and Academic council member, Karnatak University Dharwad.

He worked both in academic and administrative fields in various capacities in college and university. As Chairman, Department of Physics, Karnatak University Dharwad, HOD of Physics and electronics at J.T. College Gadag, Coordinator for workshops / symposium, Chief Coordinator of PG/UG exams, PG hostel warden, resource person to various scientific bodies, member for various professional bodies and Director /Executive Officer post for Dharwad Regional Science Center. About 65 special lectures have been given mainly to popularize the science.

He has been awarded many awards including **“State Best Teacher Award”** for the year 1997-1998 by Government of Karnataka.



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Bio-data of Dr. Vikas M. Sherle.

Assistant Professor, Department of Physics, Ramaiah University of Applied Sciences, Bangalore. Dr Vikas M. Shelar did his B.Sc and M.Sc programme from Karnatak University, Dharwad. He has completed his Ph.D. from NITK Suratkal.

Ph.D Thesis Title: "Studies on laser induced fluorescence in subsonic and supersonic jet using ketone tracers"

Teaching Experience: More than 6 years in Engineering College and University

Research Experience: Worked as research assistant for one year in **ISRO** and worked as research associate in **Dept. of Aerospace Engg., I.I.Sc and Dept. of Physics NITK, Suratkal** for more than 4 years.

Research Projects handled:

Project title: "Development of Doppler Weather Radar (DWR) data products and data analysis"

Position : Junior Research Fellow (JRF)

Period : August 2006-August 2007

Place : Indian Space Research Organization, ISRAD, Bangalore-560 058.

Project title: "Laser Shock Peening of Stainless Steel welded parts"

Position : Senior Research Fellow (SRF)

Period : August 2012-march 2013

Place : National Institute of Technology Karnataka, Surathkal-575 025.

Project title: "Study of nonlinear optical properties of organic and organo-metallic complexes"

Position : Other participation

Period : 2008-2010

- Place : National Institute of Technology Karnataka, Surathkal-575 025.

He has attended 7 National and one international conference. He has two international publications. In addition he has several publications in National and in International conferences.

Member of Professional Body:

- Life member of national shock wave society of India from 2012.



V. M. Sherle
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& Shantikumar Gubbi Science College
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JSS



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Gubbi Science College, Vidyagiri, Dharwad -580004.**

Reaccredited at the 'A' level by NAAC
"College with Potential for Excellence" recognition by UGC

Inaugural Function

DEPARTMENT OF PHYSICS

National level seminar on Photonics and its Applications
sponsored by University Grants Commission, New Delhi (XII plan)

Date: 16th September 2016, Friday

Time 10.00 AM.

- Inauguration** : **Dr.N.Vajrakumar**
Secretary, Janata Shikshana Samiti, Vidyagiri, Dharwad.
- Chief Guest** : **Prof. Santhosh Chidangil**
Head of the Dept. of Atomic and Molecular
Physics, Manipal University, Manipal.
- Guest of Honour** : **Dr. Ajith Prasad**
Finance Officer, JSS and Principal,
JSS SMI UG & PG Studies, Vidyagiri, Dharwad.
- Shri. Suraj Jain**
Development officer, JSS, Dharwad.
- President** : **Dr. G. Krishnamurthy**
Principal, JSS College, Dharwad.

Valedictory Function

17th September 2016, Saturday at 4:PM

- Chief Guest** : **Prof. Uday.S. Raikar**
P.G. Dept. of Physics, Karnatak University, Dharwad.
- President** : **Dr. G. Krishnamurthy**
Principal, JSS College, Dharwad.

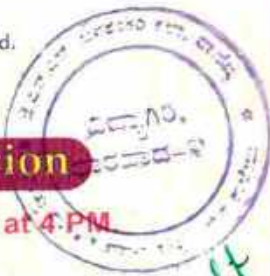
All are cordially invited

Date: 16th and 17th September 2016.
Venue: Utsav Hall, J.S.S. College, Dharwad.

Dr.K. Badesab
Organizing Secretary
JSS College, Dharwad

Dr. B.R. Gayathri
Convener
JSS College, Dharwad

Dr. G. Krishnamurthy
Principal
JSS College, Dharwad



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Photonics Techniques for Biomedical Applications:

Prof. Santhosh Chidangil,

Department of Atomic and Molecular Physics, Manipal University, Manipal-576104

Email:santhosh.cls@manipal.edu

Role of lasers is very immense in photonics and related technologies. Biomedical applications of lasers deal with the study of interaction of light with living systems. It is a continuously growing field, where the properties of electromagnetic radiation are manipulated and utilized to address biomedical problems. Laser spectroscopy methods are very popular in biology and medicine to probe molecular functions, structure and interaction mechanisms to detect, diagnose, and treat diseases by cheaper, faster, and non-invasive ways. Laser Raman spectroscopy, Laser Induced Fluorescence Spectroscopy, Laser Induced Break Down Spectroscopy and Raman Tweezers spectroscopy are the most explored techniques for biomedical applications.

The antimicrobial activity of Ag nanoparticles (NPs) is attracting attention in many fields like water purification, wound dressings, cosmetics, and biomedical devices. This extensive use of silver nanoparticles has also raised concerns about their interaction with the human body once they invade the physiological system. The micro-Raman measurement explores the interaction of AgNPs with optically-trapped, Red Blood Cells (RBCs). Raman measurements were carried out by optically trapping RBCs incubated in varying concentrations of silver nanoparticles (~100 nm) in the physiological medium. The experiments revealed that the AgNPs induce permanent transformations to the conformation of heme within an RBC from the usual R-state (oxy-state) to the T-state (deoxy-state).

The talk will cover the basics of some of the above techniques, instrumentation and applications.



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Light emitting materials: Multitude applications

-Dr. Suresh D. Kulkarni

Dept. of Atomic and Molecular Physics, Manipal University, Manipal, Karnataka

Abstract: Light plays a vital role in our daily lives and is an imperative cross-cutting discipline of science in the 21st century. Light-based technologies promote sustainable development and provide solutions to global challenges in energy, education, agriculture and health. Light and photonics are poised to become key enabling technologies of the future. There has been a serious effort in developing different materials for the generation of light. Starting from an electric bulb to the invention of efficient solid state lighting devices always saw development of new materials. The talk will focus on different light emitting materials, their methods of preparation and the applications where these materials are used. The talk will also throw some light on the ongoing works in our laboratory in this direction.

Allan

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Nanostructures in Photonics

K.S. Choudhari, Department of Atomic and Molecular Physics, Manipal University.

Nanotechnology has been an emerging frontier posing challenges for fundamental research and providing new opportunities for latest technologies. Photonics in combination with nanotechnology rules the current era of technology similar to what electronics did in the last century. Photonics with the help of nanostructures has already made its huge impact in global marketing industries and in multidisciplinary research and application fields. Research in photonics involves inter-disciplinary areas including physics, mathematics, chemistry, engineering and applied sciences, biotechnology and biomedical imaging and so on. Photonics at the nanoscale involves interaction between light and matter on a nanometer sized scale. Nanophotonics is an area where photonics merges with nanoscience and technology. The nanostructures confine light into nano-dimensions which are much smaller than the wavelength of light. These nanostructures include thin films, nanowires, nanorods, nanotubes and nanoparticles which show size dependent optical properties because of their unique and surprising electronic and photonic properties. Nanotechnology provides an easy and elegant way of tuning the material properties as per the requirement. Nanostructures can be made up of either organic or inorganic materials. Likewise nanomers are the monomeric organic structures similar to the nanoparticles. Two or more dissimilar materials can be used to prepare nanocomposites which are phase-separated at the nanometer scale. Metallic nanoparticles show exceptional optical response and enhanced electromagnetic field which forms the subject of 'plasmonics' which is one of the latest topics in the current Nanophotonics research. Similarly, there are nanoparticles which show upconversion, a process where two or more photons in the IR range are absorbed and a visible or UV photon is emitted. Currently, an area where immense research is going on in Nanophotonics is photonic crystals. Photonic crystals represent periodic dielectric structures with the periodicity in the range of dimensions comparable to the wavelength of light used. Photonics plays a crucial role in nanofabrication as well.



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Dr.U.S.Raikar

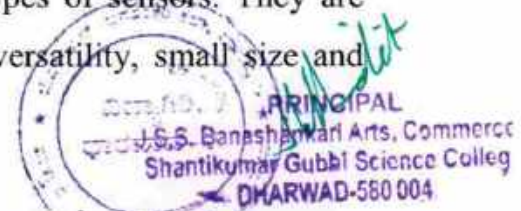
*Department of Physics, Karnatak University Dharwad
usraykar_kud@yahoo.co.in*

Photonic Sensors based on Optical Fiber Grating Technology

Photonics is the science of light. It is the technology of generating, controlling and detecting light waves and photons. Throughout 2015 the international year of light 2015 was a global initiative that attracted thousands of light based science events reached millions of people. The 21st century will depend as much on photonics as the 20th century depended on electronics. There is no clear cut distinction between terms optics, photonics and optoelectronics. One should note that photonics is not a technology to (completely) replace electrons, rather the two work hand in hand. Photonics benefits greatly from the advancements in electronics, and electronics growth along with photonics, significant and increasing overlap between the two fields called optoelectronics traditionally.

The development of optoelectronics-photonics technologies in the recent years has revolutionized modern communication and sensor technologies and other area of electronics. Concept of advanced photonics technologies are currently being explored to provide new foundations for a secure future in which sensing, imaging information processing, communication systems and networking will play a pivotal role and these system will work as integrated units. The invention of laser coupled with the development of low loss optical fibers has ignited an explosion in the field of optical communication photonics and photonics sensors. The application of photonics spread across several sectors- from optical data communication to imaging, lightening and displays, from manufacturing sector to life sciences, health care, security and safety. Today conventional technologies are approaching their limits in terms of speed, capacity and accuracy where as photonics offers new and unique solutions.

Development of fiber optics has led to a significant growth in the field of photonic sensors as they are suitable for embedding, multiplexing and remote sensing which make them perfect alternative to other sensors. Fiber optics sensors (FOS) are characterized by high sensitivity when compared to other types of sensors. They are immune to electromagnetic interface, have great geometric versatility, small size and



weight, access to normally inaccessible area and possibility of non contact measurements.

Fiber optics sensors based upon grating technology are one of the most exciting developments in the field of optical fiber sensors in recent years. The research field in optical fiber grating technology has opened a new platform in both communication and sensor field. Compared with conventional fiber optic sensors, fiber optic grating sensors have number of advantages such as non-conductivity, fast response and immunity to electromagnetic interference, and are now being widely used in the fiend of sensors such as to measure strain, pressure, temperature and as chemical sensors.

FBG has received significant attention for applications in modern telecommunication and optical sensor networks. Gratings are simple intrinsic sensing elements which can be induced into silica fiber. The fiber gratings are classified as fiber Bragg grating (FBG) and long period grating (LPG) depending on their grating period. The basic principle of operation commonly used to FBG based system is to monitor the shift in wavelength of the radiation coupled from one mode to another mode due to external environment. In the case of LPG a loss of transmitted intensity takes place by virtue of mode coupled between guided modes which consist of core mode and leaky modes. The measurement system using LPG is use to detect chemical and biological changes in the surrounding media. The simplicity and high sensitivity of LPG sensor make it worthy for food industry applications, pharmaceutical, chemical and biomedical sensing applications.

In this talk, I am going to present a compressive and systematic overview of sensors based on grating technology, including sensing principles, properties, fabrication techniques and applications. A few sensors designed in our laboratory using FBG and LPG technology will be discussed. Overall this talk is a review of photonic applications areas of fiber grating based devices.



LIF and PLIF applications in aerospace

(Dr. Vikas M. Sherle)

Laser based flow visualization techniques are indispensable tools for research in fluid dynamics and combustion diagnostics. Laser Induced Fluorescence (LIF) or planar laser induced fluorescence (PLIF) is widely used gas flow visualization technique in such investigations. In this technique, suitable molecular tracer is added in to the flow. Fundamentally, molecular tracer is selected based on the available laser wavelengths, toxicity and vapor pressure. The laser sheet (usually in ultra violet) is used as an excitation source. Emitted fluorescence images are recorded on CCD (charge coupled device) or CMOS (complementary metal-oxide-semiconductor) camera. Since fluorescence intensity depends on the various molecular parameters such as concentration, pressure and temperature. This allows qualitative and quantitative measurements using PLIF.

Jet flow visualization has several technological applications such as, understanding the physics of turbulent structures, fluid mixing, combustion and aerodynamics. A quantitative planar imaging of density distribution in fluid flow is very important in understanding the physics of turbulent processes. Knowledge of turbulent flow is of great importance mainly due to its natural occurrence in many science and engineering applications.

This lecture presents introduction to PLIF imaging technique for aerodynamic applications and the PLIF imaging of density distribution in supersonic jet flow using ketone tracer. The observed turbulent structures in subsonic and shock cell in supersonic jet are presented.



Inaugural function of two days National Level Seminar:



Key note address by Prof. Santhosh Chidangil



Special lecture by Prof.J.S.Bhat.

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A circular official stamp of the college, containing the name of the institution and the principal's name.

Participants in the programme:



H. K. Kulkarni
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Special lecture by Shri. K.S.Choudhari



Special lecture by Dr. S.D.Kulkarni



Special lecture by Dr. Vikas M.Sherle



V.K. Sherle
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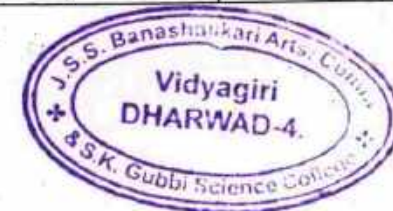
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UGC sponsored Two days National Level Seminar on 'Photonics and Its Applications' 16th & 17th September 2016



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7	Vidya M. Narasagoudra	MSc III sem.	9449926763	Vidya
8	Basavaraja. S.	M.Sc III sem.	9980434861.	Basavaraja
9	Manjunath. R.S	M.Sc (Physics) III sem	9008607412	Manjunath
0	Akash. S. Kulkarni	M.Sc (Phy) III sem	7204229531	Akash
1	Anitha Krishna. B	M.Sc Physics III sem	9108113324	B. Anitha Krishna
2	Justina. S. Doddamani	M.Sc physics III sem	8277272506	Justina
3	Sandhya S. Bhat	M.Sc. Physics I sem	8762462724	Sandhya





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8	Deepa S. Banashetti	M.Sc- physics III - Sem.		
9	Dinnya R. Badiger	M.Sc- Physics III - Sem		
10	Saivita N. J. Kulkarni	M.Sc- Physics- III - Sem.		
11	Chaitra B. Govarkar	M.Sc- Physics- I - Sem.	891765132	
12	Swarna M. Patil	M.Sc- Physics- I - Sem.	8050463119	
13	Nandini Hiremath			
14	K. S. Ambika	M.Sc physics I sem	8088313324	
15	Krutika B. Kallanagoudar	M.Sc. Physics I sem.	9945084733	
16	Megha. Y. Bevoor	M.Sc. Physics I sem	8792557910	





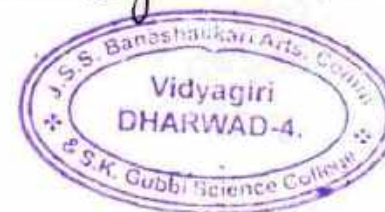
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6	Heena. Kausar.	M.sc - I - Sem.		
7	Chaitra. Hasapanahalli	M.sc - I - Sem.		
	Shweta Gupta	MSc - III sem		
	N.S. Kilar	M.sc - III - Sem.		
	Shruti Hiremath.	M.sc III rd Sem. Physics		
4	Chaitra M.B	M.sc - I st Sem physics.		
5	Arunkumar. H.C	M.sc - III rd Sem physics.		
6	Praveer G.P	M.sc - III rd Sem physics		
7	Jyoti B. P	M.sc I - Sem physics		
8	Kumuda Mager	M.Sc III sem. (Physics.)		
9	Praveer P	M-sc III u u	m02Praveer@gmail.com.	





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03	Netravati. J. Kumbhar	-Do-		Netravati (8)
04	Santrupti. Naik	-Do-		Santrupti (8)
05	Praveen .	-Do-		Praveen (8)
06	Dr. Uma. Nerle	-Do-		Uma Nerle (1)
07	M. Janibraig	ASM College for Women, BALLARY		M. Janibraig (1)
08	Ashok D. Shetkar	Karnatakacollege, Bidar		A.D. Shetkar (1)
09	Dr. M. S. Yaragop	PC Jabin Science college, HUBBALLI		msyaragop (1)
10	Jyoti Bote	J.S.S. college Dharwad	jyoti	
0.	Vishwalinga Prasad B.	G.F.G.C, Sirsi	vishwalingaprasadb@gmail.com	vishwalinga (staff)
1	Prof S. S. Raikar	K-S-S. college Gadag	prof.s.raikar@gmail.com	S.S. Raikar (1)
2	Dr. Shivanagoud K. Patil	JSS RHT PU college Dharwad	skpatil88@gmail.com	Dr. Shivanagoud K. Patil (1)





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15	Dr. Kumar I Muddani	SDMCET, Dharwad	9008448957	PKP
16	Dr. M.N. Kalasad	SDMCET, Dharwad	9880462690	PKP
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90	Apoorva. Nayak	— " —	9449897157	Apoorva
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