

**SHRI LAL BAHADUR SHASTRI DEGREE COLLEGE
GONDA-271003 (U.P.), INDIA**



Report

on

National Conference

on

**“Smart Materials and Devices for Sustainable
Technologies”**

organised by

Department of Physics & IQAC

Shri Lal Bahadur Shastri Degree College, Gonda (UP)

(Affiliated to Dr RML Avadh University Ayodhya, UP)

20- 21 June, 2022

Co-Sponsored by

Satya Saroj Foundation, Gonda

&

State Bank of India, Main Branch, Gonda

The Department of Physics and IQAC of Shri Lal Bahadur Shastri Degree College, Gonda had jointly organised a two day national conference on “**Smart Materials & Devices for Sustainable Technologies**” on **20-21 June, 2022**.

The inaugural session was attended by Dr Ujjwal Kumar, IAS, DM Gonda, Ms Varsha Singh, Vice President, Management Committee, Shri Lal Bahadur Shastri Degree College, Gonda, Shri Umesh Shah, Secretary, Management Committee, Shri Lal Bahadur Shastri Degree College, Gonda, Prof S N Shukla, Deptt of Physics, Dr RML Avadh University, Ayodhya, UP. **The Chief Guest & Patron of conference was Dr Ujjwal Kumar, IAS and Keynote speaker was Prof S N Shukla.** The e-souvenir/ abstracts were also screened in this session by dignitaries on dais.



Photo 1: - Inaugural Speech by IAS Dr. Ujjwal Kumar

In the welcome address, **Prof Jitendra Singh, Professor & Head, Department of Physics & Convener** of this National Conference welcomed all delegates, Keynote speaker Prof. S N Shukla & all dignitaries came from various states of the entire country. Prof Singh whole heartedly appreciated the Satya Saroj Foundation, Gonda & State Bank of India, Main Branch, Gonda for providing financial aids and co-sponsoring this national event.



Photo 2: - Welcome Address by Dr. Jitendra Singh

In the Presidential address, **Prof R K Pandey, Principal, Shri Lal Bahadur Shastri Degree College, Gonda**, firstly pay gratitude to guest on dais & respective delegates. He told that the demand of the time today is that achieve a progressive outcome by joint study of inter-disciplinary subjects and that's why it has been included in the curriculum under the new education policy. The development of Genetics, DNA mapping etc. is the result of study of various streams of science together.



Photo 3: - Presidential Address by Prof, R.K. Pandey

Ms Varsha Singh, Co-Patron, Vice President, College Management Committee & Founder of Satya Saroj Foundation, Gonda stated that Today, we find works of science everywhere, from tiny needles to fighter planes. We all have mobiles in our hands and computer screens in front of us, everything is the result of scientific inventions. Science is the applied method of learning. She told specially to students that the important things learned from this seminar will always be beneficial in your life. By presence of great scholars amongst them, students will be able to enhance their talent further. She said that, take the positive things received from this seminar to your home. She wished all the best and good luck for success of the conference.



Photo 4: - Co-Patron, Vice President Ms. Varsha Singh

Shri Umesh Shah, Co-Patron, Secretary, College Management Committee, Shri LBS Degree College, Gonda stated that he was very pleased & enthusiastic when he has come to know that such an academic event organised by Department of Physics. Today, a huge number of delegates are present here including renowned scholars. Certainly, this academic meet will be enlightened with learning of new and innovative ideas and very fruitful to all delegates and nation too.

Addressing the inaugural session, eminent scholar **Professor S N Shukla, Keynote speaker** of the conference said that “If energy is represented in the right direction, then we can reached top heights of the success.” Today 60% of India’s population is youth. With being youngest population, the next 25 years are very important and golden opportunity for India to make its dream of becoming a global power come true. New- fresh ideas come in the mind of the students and the future can be made bright by carving those ideas. By giving the example of University of Pennsylvania, USA he told that for developing the new ideas they are working in their laboratories with the collaboration and contribution of industries etc. and when a fruitful idea comes out, they buck up it and start further researches. He also told that, ‘Today, India needs a psychological analysis of the students so that positive things can be developed at the grassroots level.’



Photo 5: - Keynote Speaker Prof. S.N. Shukla

Dr Ujjwal Kumar, IAS, Patron & Chief- Guest of inaugural session appreciated for organising such an important and academic event based on student centric activity and wished for success of the conference. In his talk he stated that the sustainability is so important thing for world. Entrepreneurship, start-ups in current world are changing the society & these ideas are so important for progressive world. He also

motivated students & delegates by giving example of Mr Elon Musk for his ideas regarding technological developments of electric vehicle. He urged students & all responsible citizens have to know what is happening around the world. Being a good scholar every student should know their subjects & allied stream in explored manner. At last, he wished to all the delegates & organising committee.

After the successful inaugural session, the **first technical session** started, and chaired by **Prof Sunil Pratap Singh, Principal**, SB PG College, Badlapur, Jaunpur & **Prof Shailendra Nath Mishra, Professor & Head**, Deptt of Hindi, SLBS Degree College, Gonda & **Co-Convener** of the conference. In the first technical session, the first research paper presented by **Prof S N Shukla** on topic “**Low Frequency Small Signal Amplifier using BJT- JFET in Sziklai pair topology**” in which he told about the use of electro encephalograph and seismometer in circuit design. In his versatile lecture, he explored the topic by including function of EEG which is useful in measurement of tumour, stroke and brain disorder while Seismic waves detect earthquakes. He told that the small- signal amplifiers are key contributors to a number of electronic & communication circuits. He also explored the development regarding Sziklai pairs after 2012.

The second paper presented by **Mr Syed Mohd Shadab, M Sc. Final**, Deptt of Physics, SLBS Degree College, Gonda on topic “**Multiplexer & Demultiplexer.**” The third paper presented by **Ms Srishti Rai, M Sc Final**, Deptt of Physics, SLBS Degree College, Gonda on topic “**Magnetism.**” The fourth paper presented by **Ms Deepanshi Srivastava, M Sc Final**, Deptt of Physics, SLBS Degree College, Gonda on topic “**Encoder & Decoder.**” The fifth paper presented by **Ms Shraddha Srivastava, M Sc Previous**, Deptt of Physics, SLBS Degree College, Gonda on topic “**Metal oxide Semi-Conductor field effect Transistor (MOSFET).**” The Sixth presentation done by **Ms Arti Sharma, M Sc Previous**, Deptt of Physics, SLBS Degree College, Gonda on topic “**Operational Amplifier.**”

The **Second Technical Session** was chaired by **Prof Vandana Saraswat, HoD**, Deptt of Med. & Modern History, SLBS Degree College, Gonda & **Prof R S Singh, Coordinator, IQAC & Co-Convener** of the conference. The session started with an invited lecture of **Prof S K Tripathi, Dean, Research & Consultancy, Mahatma Gandhi Central University, Motihari, Bihar** on topic “**Waste to Wealth: Pathway to Renewable & Sustainable Energy.**” In his talk he focussed on

conversion of waste material into valuable material such as green plant provide oxygen, Climate change, Wind ecology, Solar sustainable energy, Green- house gases (CH_4 , CO_2 , SF_4 , N_2O) trap heat which is playing an important role in global warming and told about world polluted cities in which India having second position. Waste materials used in usable material by favourable resourcing process, Biomass can be converting into different type of energy such as energy storage Li-ion battery energy storage super capacitor electrical vehicles.

The second research paper presented by **Mr Abhinav Tripathi, Research Scholar** on topic “**Compound Push- Pull Power Amplifier for wide Frequency Band.**”

The second day started with another plenary lecture provided by **Dr Ajeet Kumar Maurya, Department of Physics, School of Physical and Decision Science, Babasaheb Bhimrao Ambedkar University (BBAU), Lucknow** on topic “**Global Positioning System (GPS) as Smart Device in Modern Era**” with chair-persons on dais **Prof Sanjay Kumar Pandey, HoD Deptt of Mathematics & Co-Convener** of the conference and **Prof Shrawan Kumar Srivastava, HoD, Deptt of Botany, SLBS Degree College, Gonda & Co-Convener** of the conference. In his comprehensive talk Dr. Maurya elaborated the navigation system in various age like Navigation system in stone- age, Early navigation tools in star age, Modern Navigation System which are totally based satellite technology. He discussed about the three segments of GPS as The Space Segment, Control Segment & User segment in which the control segment also having three segments as Monitor station, Master Control Station & Ground antennas. He also talked about the Indian positioning system like IRNSS which also known as NavIC, GAGAN.

The second presentation was done by **Mr Mohan Bhaskar Tiwari, M. Sc Previous**, Deptt of Physics, SLBS Degree College, Gonda on topic “**FET Transistor**” elaborating with JFET & MOSFET.”

In this fruitful technical session some paper presentation also done in **online mode by Google Meet**. In online presentation the first paper presented by **Mr Deependra Kumar Pandey, ASET, Amity University, Lucknow** on topic “**IOT based Sustainable Fire Suppression System**” & “**Advance Plant Monitoring System.**” Mr Pandey talked about the smart agriculture irrigation system, Major components of IOT, IOT monitor etc.

The second online presentation done by **Mr Prateek Arora**, Dr Bhimrao Ambedkar University, Agra on topic **“Study of various Geometry Designs of Bipolar Plate in Proton Exchange Membrane Fuel Cells.”** His presentation focussed on classification of fuel cells, Basic structure of PEM Fuel cells, Bipolar Plate, Roll of Bipolar Plate (Flow Field Plate), Types of Bipolar Plate Designs, Impact of Flow Field designs etc.

The third online presentation was given by **Mr Purushottam Kumar**, Deptt of Physics, Institute of Basic Science, Dr Bhimrao Ambedkar University, Agra on topic **“Study of Thermal Behaviour of Li-ion Batteries”** in which he comprises the types Battery, Key Battery Attributes like Energy Density, Power Density, Safety, Life, Cost, Advantages & thermal behaviour of Li-ion batteries.

The **Fourth & Fifth Technical session** was chaired by **Prof D K Dwivedi**, Madan Mohan Malaviya University of Technology, Gorakhpur, **Dr Arvind kumar Sharma**, Associate Professor, Deptt of Zoology, KS Saket PG College, Ayodhya and **Prof J P Pandey, Principal**, MLK PG College, Balrampur.

In this technical session the first online presentation was presented by **Mr Prem Pratap Singh**, Deptt of Physics, RBS College, Agra on topic **“Modelling and Stimulation approach for Analysis of multifunction Solar cells.”** In his presentation he elaborated the solar cells, parameters of solar cells, short circuit density, open circuit voltage, fill factor, fabrication methods i.e metal organic vapour phase epitaxy, metal organic chemical vapour deposition, Atomic layer epitaxy, Mechanical stacking inverted Meta- Morphic Growth (IMM).

In the sequence of paper presentation **Mr A S Mathur** presented his paper on topic **“Stimulation study of Transition metal Dichalcogenide Solar cells using SCAPS.”**

Mr Vikas kumar Rajput, Deptt of Physics, Institute of Basic Sciences, Dr Bhimrao Ambedkar University, Agra presented his research paper titled **“Feasibility Analysis of Standalone PV System”** in which he discussed about photovoltaics, Photovoltaic cell, Generation of PV, Classification of Solar Photovoltaic system, Challenges, PV system 7.1 software package etc.

Ms Abhilasha Singh, Deptt of Physics, RBS College, Agra presented a paper titled **“Role of membrane in PEM Fuel Cells”** with exploring the history of PEM

fuel cells, components and types of PEM fuel cell, working module of membrane, utility of fuel cell etc.

Mr Ram Lakhan Singh, Deptt of Physics, RBS College, Agra presented his research paper on topic **“Effect of Tilt Angle and Shadow on Performance of Solar Panels.”**

The next research paper presented by **Ms Bharti Sharma**, Deptt of Physics, Institute of Basic Sciences, Dr Bhimrao Ambedkar University, Agra on topic **“Performance enhancement of BHJ organic solar cell by incorporating Carbon nanotubes as Transparent Conductive Electrode.”**

At last, in technical session fifth, a very important & fruitful lecture delivered by **Prof D K Dwivedi**, **Madan Mohan Malaviya University of Technology, Gorakhpur** on topic **“Solar Photovoltaics as a Renewable Energy Alternative: Current States and Future Prospects.”** Before starting his topic, he discussed about the importance of smart materials in present scenario where every stream of science are keen towards it. At global level a big percentage of researchers are engaged in their research with smart material. The overall objective of these researches to gain better quality & performance of devices. The advancement of materials reforms the whole society & world as well. Prof Dwivedi emphasized to improve quality of education. He stated that “It is progressive to be a student for better of students.” Further, exploring his discussion, he elaborated about renewable energy sources as solar energy. He discussed that it is necessary that material using for solar cell should be economic, easily available & more efficient. In present world, need of energy from renewable sources will have increased.

He illustrated that solar cell should be efficient about light absorber, carrier collector & metal contacts. The heart of a solar cell is the absorber layer. In this technology only that materials will be helpful, which has great efficiency of absorption. His overall talk outlined with following parameters as: Need for energy from renewable resources, the photovoltaic solar cells, solar cell generation, thin- film vision looking to the future, searching for more abundant materials, introduction of CZTS and their properties, Perovskites, organic- Inorganic Hybrid Perovskites, Material Properties: Good for Photovoltaics, Attributes of Perovskite solar cell, optimization of PSC & future prospects of PV.

By quoting Paris agreement for reducing Carbon Emission, he stated that Paris Agreement aims at producing 40 percent of the installed electricity capacity by 2030 from non-fossil fuels which means it will have to produce 100 gigawatt from solar, 60 gigawatt from wind, 10 gigawatt from biomass & 5 gigawatt from small hydro- power by 2022.



Photo 5: - Giving Presentation by Delegates

These are some important highlights about selected research papers for presentation in conference. Each paper session was followed by questions and answers.

In the valedictory Session chaired by **Prof D K Dwivedi, MMMUT, Gorakhpur, Ms Varsha Singh, Vice President**, Management Committee, Shri Lal Bahadur Shastri Degree College, Gonda, **Shri Umesh Shah, Secretary**, Management Committee, Shri Lal Bahadur Shastri Degree College, Gonda, and speech delivered by **Prof R K Pandey, Principal**, Shri LBS Degree College, Gonda. **Shri Santosh Kumar Srivastava**, Assistant Professor, Deptt of Physics, Shri LBS Degree College, Gonda & **Organizing Secretary** of this conference presented the summery of two day long deliberations. In this session the distribution of conference certificate to all delegates from dais also done by organizing team.

The vote of thanks was delivered by **Prof Jitendra Singh, Professor & Head, Department of Physics, Shri Lal Bahadur Shastri Degree College, Gonda**. He delivered gratitude to Patron of the conference, Dr Ujjwal Kumar, IAS, for providing his valuable time, Co-Patron Ms Varsha Singh & Mr Umesh Shah, President of

The conference was over with singing of our National Anthem.

These are some important media highlights of seminar

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प्रधायन को, जे. पी. पांडेय, प्रो. पी. के. शिंदे, प्रो. आलोक मुखर्जी ने उपस्थित होकर सांघी की को समुद्र किया। साकेत कॉलेज, अयोध्या के डॉ. अरविंद शर्मा ने तृतीय अरविंदी सत्र की सहायता करी।

सभी अगम ज्ञानियों को प्रति-अन्यत आत्म भौतिक विद्या के अति-प्रोफेसर साकेत कुमार श्रीवास्तव ने संबोधित किया।

तत्कालीनी सत्रों का संश्लेषण एमएफएसी उद्घाटन, भौतिक विद्या के विद्यार्थी हर्ष श्रीवास्तव और वैभव टंडन ने किया।

पूर्व प्रधायन को, वंदना सारस्वत, महाविद्यालय आठवकुरी की समन्यक को, आर. एच. सिंह, प्रो. अतुल कुमार सिंह, प्रो. राजय कुमार पांडेय, प्रो. रोहित कुमार पांडेय, प्रो. मन्मथ श्रीवास्तव, प्रो. मुकुल शिन्हा, प्रो. अमन चंदा, प्रो. अमय कुमार श्रीवास्तव, प्रो. जय शंकर शारदा ने आयोजन-प्रबंधन का दिवसीय निष्ठा। मनीष शर्मा, डॉ. निषिवा शिंदी, डॉ. पुष्पाक्षि सिंह, डॉ. बुलेन बाबुर शिवकाम, डॉ. मालवी सिंह, डॉ. दिनेश मुखर्जी, डॉ. अजित मीर्य, डॉ. शोभित मीर्य, डॉ. अमित मुखर्जी, मन्ना, अनुराग, राधेश्वर सिंह अगम शिक्षकों ने कार्यक्रम में उपस्थित रहकर सुलोक विद्वत्स्य बानने में योगदान दिया। डॉ. पिंका श्रीवास्तव, डॉ. दीपन, डॉ. अश्विनी, डॉ. वृजेंद्र बहादुर शिवकाम, डॉ. अशोक पांडेय ने सोमनाथ का सार-संयमन किया। डॉ. मिलालाक्षि मुखर्जी, डॉ. रियाता शर्मा, डॉ. रंजित शिंदी, डॉ. रोहन, डॉ. संयम सिंह, डॉ. ६ मंद तारा सिंह, जगज्जगद मन्त्र ने शोभायिको को पंजीकृतकरण सत्र किया। डॉ. नीतू मुखर्जी, डॉ. प्रसेन, प्रो. विषय के मुखर्जी ने उत्कृष्ट छात्रको ने शोभन प्रकाश। अपने ने महामुख्य योगदान दिया। रातनीकी टीम ने सर्वकर्म को सत्य किया और ऑनलाइन शोभायिकी की प्रस्तुति करवाए। 467 प्रतिभागियों ने ऑनलाइन-प्रतिभागिता की। 66 शब्द सार प्राप्त हुए। दो विद्वत्स्य कोलेज में लगभग शोभायिकी ने अपने शोभा-पत्रों का वाचन किया।
