



A REPORT ON

25th National Conference on Condensed Matter Physics, Condensed Matter Days (CMDAYS17)

1. Name of the Event: :**25th National Conference on Condensed Matter Physics, Condensed Matter Days (CMDAYS17)**
2. Duration, and Date: 03 Days, 29-31 August 2017
3. In collaboration with (*if any, mention the name of the organization or individual or others*): NA
4. Number of participating students: [*Please enclose the certified list of students*]
5. Number of resource persons (*if any*): 16 (Plenary Talk: 02, Invited Talk: 14)
6. Names, affiliation, and contact of resource persons: **Annexure-A** Attached
7. Summary of the event:

Condensed Matter Days is an annual event, a national conference in Condensed Matter Physics. The 25th edition CMDAYS17, was organised by Department of Physics, Tezpur University from August 29th-31st, 2017. In this event, nearly 150 participants from various parts of our country attended the event. There were 2 plenary talks (PT) and 14 invited talks (IT) from eminent scientists and subject experts as well as 30 oral and 65 poster presentations accommodated in the conference. In the inaugural session, the convener **Dr. D. Mohanta** gave the welcome speech.

CMDAYS17 was inaugurated by the Vice-Chancellor, Tezpur University, along with other dignitaries on the dais. A bi-lingual Souvenir was brought out as a part of the silver jubilee event (25th edition) and released during the inaugural session. The Vice-Chancellor, in his inaugural speech stressed upon the interdisciplinary nature of Condensed Matter Physics, which is one of the vibrant branch of physics that deals with diverse techniques and phenomena. He expressed his goodwill to the colleagues of Department of Physics, Tezpur University for organising CMDAYS17. With heartfelt wishes, he wished the conference a grand success. **Prof. A. Choudhury**, former VC of Gauhati University and former Pro-VC of Tezpur University chaired the first session.

The content details of two plenary talks are as given below.

The first plenary talk was from **Prof. Bikash K. Chakrabarti** from SINP, Kolkata. His topic was “**Econophysics of income and wealth**”. He explained income distribution analogy in kinetic theory of gases. He talked about inequalities in income and wealth distributions which have been a permanent feature of the societies in any civilization, and are characterized by universal laws. The first established theory of Condensed Matter systems, namely the century old kinetic theory for the gases, had long been identified as a possible tool to explore the origin of such inequalities. He discussed about such kinetic exchange formulations for social dynamics and indicated about the recent developments. He also discussed about the extension of the kinetic theory to collective opinion formation in societies.

The plenary talk 2 was delivered by **Prof. S.K. Dolui**, Department of Chemical Sciences, Tezpur University. He talked about “**Organic Photovoltaic Devices**”. He demonstrated the development of some metal/metal oxide and hybrid semiconducting nanoparticles using sol-gel method and their use as working electrode in Dye Sensitized Solar Cells (DSSCs). In recent times, polymer gel electrolyte offers a great deal of research as it possesses the properties of solid as well as liquid. The speaker described development of some counter electrode (CE) material as an alternative to platinum (Pt) CE in DSSCs. NiS anchored graphene/polyaniline nanocomposites and α -MnO₂/Carbon black binary complex are used as CE materials. A maximal efficiency as high as 5-6%, and with maximum V_{oc} of 0.8 V and J_{sc} of 12 mAcm⁻² could be recorded for the systems of DSSCs.

An invited talk was delivered by **Prof. Tarak Nath Dey**, IIT Guwahati on the topic “**Phase dependent electromagnetically induced transparency**”. The talk was interesting as it gave a novel scheme for



coherent generation, control and manipulation of structured beams in a system of homogeneously broadened atomic vapor with atoms in a closed three-level Λ -configuration has been used to explain the recent experimental results of Radwell et al. He demonstrated how the coherent control field can be used to manipulate an azimuthal modulation of the absorption profile that is dictated by the phase and polarization structure of the probe beam. He also discussed the mechanism of efficient generation and manipulation of an optical beam which may have important applications in information science and optical communications.

The session started with the fourth invited talk delivered by **Prof. B.R Sekhar**, IoP Bhubaneswar on the topic “**Surface band structure of topological insulators: an ARPES perspective**” He talked about the studies of surface state (SS) bands in many Bi and Sb based binary Topological Insulators (TI) which are marred by significant contributions from their bulk states. He discussed about the results of their angle resolved photoelectron spectroscopy (ARPES) studies on some of the TIs focusing mainly on BSTS. He also discussed the density functional theory (DFT) results on similar systems. Signals of non-trivial topology of the surface state bands (SSB) and a strong warping of the Fermi surface (FS) are demonstrated with the help of ARPES data.

The next invited talk was delivered by **Prof. Krishnendu Sengupta**, IACS Kolkata on the topic “**Transport on topological insulator surfaces**”. In this talk, he provided a short introduction to topological insulators with emphasis on spin-momentum locking of Dirac electrons on their surface. This was followed by a discussion of transport of such spin-momentum locked Dirac electrons. In particular, he discussed the passage of such electrons through magnetic barriers and then showed that, they may lead to a magnetic switch for electric current through such junctions.

The next invited talk was given by **Prof. M.C. Mahato**, NEHU, Shillong on the topic “**Resonance oscillation of a damped driven simple pendulum**”. He discussed the results of their calculations of the resonance frequency of a damped driven simple pendulum along with the resulting amplitude of oscillations. The problem is equivalent to the study of motion of a damped particle in a sinusoidal potential driven by a time periodic sinusoidal force of small amplitude so that the particle always remains in the initial well of the sinusoidal potential.

The oral presentations were followed by the **valedictory session** presided by **Prof. Ramesh C. Deka**, Dept of ChemSci, Tezpur University. During the **valedictory session**, certificates were distributed to the participants, delegates and student participants spoke about their experiences regarding the overall conference. At the end, there was a vote of thanks by **Dr. D. Mohanta, CMDAYS17**. With this, the national conference **CMDAYS17** came to an end successfully with an announcement of **CMDAYS18**, for which Burdwan University was considered as the next venue.

8. Photographs with captions, and dates: **No**



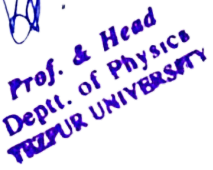


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Signatures of Conveners/ Coordinator/ In-charge	Signature and Seal of Head of Department/ Centre/ Cell
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