UGC-DAE Consortium for Scientific Research
विश्वविद्यालय अनुदान आयोग - परमाणु ऊर्जा विभाग वैज्ञानिक अनुसंधान संकुल
(An autonomous institution of UGC, New Delhi)
(विश्वविद्यालय अनुदान आयोग, नई दिल्ली द्वारा स्थापित स्वशासी संस्थान)
(Formerly : Inter University Consortium for DAE Facilities; IUC-DAEF)

Indore Centre
इन्दौर केन्द्र

Dt: 22-2-07

To Whomsoever It May Concern

This is to certify that Dr. T. Goverdhan Reddy has been working as Research Associate (CSIR) under my supervision since June 2006. He is presently working in the area of Experimental Physics with specific attention to Low Temperature Physics of Materials.

I have no objection if he takes up a postdoctoral position under the supervision of Professor Chen Y. Liu, Indiana University Cyclotron Facility, Bloomington, USA. The research work being carried out at the Indiana University Cyclotron Facility is suited to his research interests. Hence, it is a good opportunity for Dr. T. Goverdhan Reddy to work at Indiana University Cyclotron Facility at Bloomington, USA. His training abroad will be of great help to get an exposure in frontier research in this area and also in improving his career.

(AJAY GUPTA)

Prof. Ajay Gupta
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T. Goverdhan Reddy

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May 14, 2012

To whom it may concern,

In response to Dr. Goverdhan Reddy's request, I am writing a letter of reference for his review at the Guru Ghasidas University. Goverdhan worked in my research group from 2007-2009, during which he was assigned the responsibilities to setup sample preparation facilities, to characterize garnet insulator samples using X-ray diffraction and magnetic susceptibility measurements. He was also in charge of setting up a piece of major instrument: a cryogen-free dilution refrigerator, and oversaw its day-to-day operations.

In my research group, we have been working on a challenging experiment to develop techniques using a solid-state system to search for the electric dipole moment of the electron. The electric dipole moment (EDM) of electron requires a violation of both parity inversion symmetry and time-reversal symmetry. This new technique uses sensitive magnetometers, like superconducting quantum interference device (SQUID), to measure bulk magnetization that is induced by a strong external electric field, through a non-zero permanent EDM. Any solid-state related effect, such as magneto-electric effect, could mimic the effect we are trying to measure. Based on his trainings in condensed matter physics and expertise in magnetic system, I recruited Goverdhan to study the possible systematic effects on the sample we will be using: Gadolinium Gallium Garnet (GGG).

GGG is an insulator with high number density of valence electrons, whose spin adds up to give a large magnetic moment on the Gadolinium ion. It is well known for its peculiar behavior of geometrically frustrated spin glass phase at low temperature. However, for our purpose, we need the magnetic system to be as close to a paramagnetic system as possible. Goverdhan looked into the technique of "spin dilution" that by reducing the concentration of Gadolinium ions by replacing them by non-magnetic Yttrium ions. This should effectively reduce the temperature of the spin glass phase transition, allowing the measurements to be made at lower temperatures and still in the paramagnetic state. In addition, the spin dilution could enhance the achievable magnetic susceptibility by reducing the Curie-Weiss temperature. Goverdhan has done a good job in achieving this task. He solved the over-temperature problem of the new furnace and successfully synthesized the samples with various concentrations of Yittrium dopants using the oxide powder sintering at 1550 degree C. He verified the garnet structures using X-ray diffraction using the machines in the Chemistry and Geology departments at IU. He has also developed a compensation electric circuit to improve the performance of his AC susceptometer coils that allow measurements in sub-Kelvin temperatures.

T. Goverdhan Reddy

The results of his low temperature susceptibility measurements using a SQUID susceptometer have suggested that the spin dilution should help to solve this particular question.

Furthermore, to enhance the sensitivity of the EDM search, we are preparing to cool down the sample and high voltage assemblies to milli-Kelvin range. This would require a dilution refrigerator. During 2008--2009, Goverdhan was in charge of setting up a new cryogen-free dilution refrigerator constructed by Leiden Cryogenics. He oversaw the various details in getting the lab utilities ready to ensure a smooth commissioning when the dilution refrigerator first arrived at our lab in December 2008. Over a few months he quickly learned the detailed operation of this piece of major equipment and took the responsibility in overseeing the daily operation of the refrigerator. In particular, he had perfected the soldering technique, and he was the only one in the lab I would trust to make vacuum-tight joints on the capillary lines on the modifications we implement on the dilution refrigerator. Using this dilution refrigerator, we have successfully carried out the first experiment to study the scintillation yield in liquid helium under the application of high voltage in superfluid helium. This experiment has produced key results required to move the neutron EDM experiment toward the next stage of the review process. Goverdhan was one of the members who put together hard works taking 24 hour shifts in data-taking.

Goverdhan tried very hard to make himself a useful member in the group. Overall, he made significant contributions in his assigned tasks. I would had hoped that he could be more independent in searching for problems and taking the initiatives in solving them with relatively little amount of guidance. However, considering that he was trained in condensed matter physics and has just started immersing himself in the field of nuclear physics and fundamental physics field two years ago, there are a lot asked of him to be able to learn everything quickly and start to perform as an independent researcher.

After two years of research in fundamental nuclear physics, Goverdhan decided that his passion is still in material physics and has decided to switch his research focus back towards condensed-matter based research using his expertise in material synthesis, Mossbauer, Raman, UV VIS, IR based spectroscopy, and his newly gained experience in low temperature experiments. I believe that given the right research project the interest him, Goverdhan can do very well. In my group, Goverdhan has demonstrated the capability to work independently and has accomplished the majority of the assigned tasks. I believe that his plan to develop a fabrication laboratory with photolithography in the Department of Pure and Applied Physics, Guru Ghasidas University will be successful.

If you have further questions, please don't hesitate to contact me.

Sincerely yours,

Chen-Yu Liu

Chen-Yu Liu
Associate Professor of Physics
Department of Physics
Indiana University, Bloomington

T. Goverdhan Reddy

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March 26, 2017

To whom it may concern,

This is to certify that Dr. Goverdhan Reddy Turpu has worked as Research Professor at my lab in Graphene Research Institute, Sejong University, Seoul from 16.11.2010 to 27.07.2011. Dr. Turpu worked actively on a research project on "Relaxation of electrical transport in graphene based mesoscopic electronic devices". During the research project, Dr. Turpu showed endless endeavor and enthusiasm in performing the electrical property characterization and device fabrications. His conduct was excellent during his stay at my laboratory.

Please feel free to contact me for any further information.

Sincerely yours,

Jonghwa Eom, Ph.D.
Provost of the Academic Affairs Office
Professor of Department of Physics
Sejong University

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June 1, 2011

TO WHOM IT MAY CONCERN

This is to certify that, Dr. Goverdhan Reddy Turpu has worked at the International Institute of Physics/Department of Physics, UFRN, Natal , Brazil from Feb. 2010 to Oct. 2010. He has maintained good conduct throughout his stay here.

I wish success to him in his future endeavors.

S.K. Malik, FNA, FASc
Visiting Senior Professor,
DFTE, UFRN, Natal, Brazil

T. Goverdhan Reddy