Research and Academic Collaboration with School of Studies in Chemistry	
1.	Desert Research Institute, U.S.A.
2.	Washington University at St Louis, USA
3.	Chinese Academy of Sciences, Xi'an, China
4.	University degli Studi di Brescia, Italy
5.	University Degli Studi di Torino, Torino, Italy
6.	Moscow State University, Russia
7.	Federal University of Santa Catarina, Brazil
8.	Department of Environmental Engineering & Science, Chia Nan University, Taiwan
9.	University Hospital Biomedical Research Center, Sokolska, Hradec Kralove
10.	National Environmental and Engineering Research Institute, Nagpur
11.	Department of Chemistry, King Fahad University of Petroleum & Minerals, Dhahran, KSA
12.	Cancer Research Laboratory in Radiation, Biology and Health Division, Bhabha Atomic Research Centre, Trombay, Mumbai for in-vitro and in-vivo studies
13.	Institute of Science, Nagpur for Software Drug Designing
14	Defense Research Development Organization, Gwalior
15.	Central Drug Research Institute, Lucknow
16.	National Metallurgical Laboratory, Jamshedpur

Washington University in St. Louis
SCHOOL OF ENGINEERING & APPLIED SCIENCE

July 10, 2016

To
Dr. Shamsh Pervez
Professor of Chemistry
Pt Ravishankar Shukla University, Raipur, CG, India, 492010

Subject: Your appointment as an International Expert in research project entitled: *Assessing the Warming Amplification over South Asia due to Organic Carbon Aerosols from Residential Biofuels*; Total outlay: $38,000; Duration: June 2015 – May 2017; Sponsor: International Center for Advanced Renewable Energy and Sustainability (I-CARES)

Dear Dr. Pervez,

In connection to subject stated above, the Department of Energy, Environmental and Chemical Engineering at Washington University in St. Louis, USA has appointed you as international expert in the above stated research project to extend your expertise in air quality monitoring and analysis.

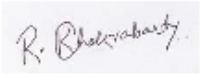
Terms and conditions:

During the execution of this project, you will be entitled to avail costs for the instrumental facilities for physico-chemical analysis of various atmospheric samples, postage services for sample dispatch, all scientific software (online) and field sampling in India along with all accessories required during air sampling.

In addition to this, you will co-authored in research publications arising from the project outcomes.

Looking forward to your active participation in the said project. If you have any questions or need additional information, please do not hesitate to contact me at 314-935-6054 or at chakrabarty@wustl.edu

Sincerely,



Dr. Rajan Chakrabarty,
Assistant Professor
Department of Energy, Environmental and Chemical Engineering,
Washington University in St. Louis

Desert Research Institute
2215 Raggio Parkway
Reno, NV 89512-1095
United States of America

May 12, 2011.

It is hereby certified that a research collaboration between Desert Research Institute (DRI) and Shamsh Pervez, Associate Professor of Chemistry, Pt. Ravishankar Shukla University, Raipur, CG, India has been established to conduct a pilot research study entitled, " Development of source inventories and assessment of indoor air quality by emissions resulting from religious and ritual based activities". The sponsor of this pilot study is DRI. The collaboration data is as:

1. **Shamsh Pervez, SOs in Chemistry, Pt. Ravishankar Shukla University, Raipur, India**
   (A) Designing of study and sampling plan using established criteria of air monitoring.
   (B) Sampling of Particulate Matter (PM) mass and VOC's in selected religious places and events of ritual/religious based activities viz. wedding ceremony using PM samplers and passive samplers for air organics.
   (C) Simultaneous sampling of CO_2 and CO gases within the identified sampling site and defined atmospheric levels.
   (D) Source apportionment studies, if found feasible.
2. **Dr. Barbara Zielinska, Research Professor, Division of Atmospheric Sciences, Desert Research Institute, Reno, NV, USA**
   (A) Chemical analysis for VOC's and other selected organic speciation along with data interpretation
3. **Dr. Rajan Chakrabarty, Assistant Research Professor, Division of Atmospheric Sciences, Desert Research Institute, Reno, NV, USA.**
   (A) Analysis of PM mass for carbonaceous content and other selected chemical species, if needed
   (B) Interpretation of data and receptor sites analysis for emission factors
   (C) Publication process of results, if found feasible

Dr. Barbara Zielinska
Desert Research Institute

Dr. Rajan Chakrabarty
Desert Research Institute

Dr. Shamsh Pervez
Pt. Ravishankar Shukla University

desert research institute

Nevada System of Higher Education

Division of Atmospheric Sciences
phone: (775) 674-7046
fax: (775) 674-7009
email: johnw@dri.edu

February 28, 2011

To whom it may concern:

I am pleased to confirm our collaboration with the School of Studies in Chemistry, Pt. Ravishankar Shukla University, Raipur, CG, India, for research being proposed by Dr. Shamsh Pervez, Associate Professor of Chemistry at and currently a Fulbright Fellow working at the Desert Research Institute (DRI) in Reno, Nevada, USA. This collaboration includes: 1) working with professors and students at Pt. Ravishankar Shukla University on data analysis and publications; 2) sharing our DRI research facilities with professors and students when they visit the United States; and 3) seeking joint sponsorship for future research projects. DRI's analytical capabilities will be made available to externally-sponsored research projects on a cost-reimbursement basis to be mutually agreed upon.

We have appreciated working with Dr. Pervez during his current Fellowship and would look on this relationship as a model for future cooperative research.

Sincerely,

John G. Watson

John G. Watson, Ph.D.
Research Professor

2215 Raggio Parkway
Reno, NV 89512

M.V.Lomonosov Moscow State University
D.V.Skobeltsyn
Institute of Nuclear Physics
1/2, Leninskie Gory
Moscow, Russia, 119992
Phone: +7 (495) 939-18-18
Fax: +7 (495) 939-08-96
E-mail: info@sinp.msu.ru

January 15, 2013

To whom it may concern:

I am pleased to confirm the research collaboration between Skobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University, Moscow, Russia and the School of Studies in Chemistry, Pt. Ravishankar Shukla University, Raipur, CG, India, for research being proposed by Dr. Shamsh Pervez, Professor of Chemistry at and former Fulbright Fellow worked at the Desert Research Institute (DRI) in Reno, Nevada, USA. This collaboration includes: 1) working with professors and students at Pt. Ravishankar Shukla University on data analysis and publications; 2) sharing our research facilities with professors and students when they visit the Moscow State University; and 3) seeking joint sponsorship for future research projects. Analytical capabilities of Skobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University will be made available to externally-sponsored research projects on a cost reimbursement basis to be mutually agreed upon.

Sincerely,
Dr. Olga Popovicheva
Leading Scientist,
Department of Microelectronics,
Skobeltsyn Institute of Nuclear Physics,
Moscow State University
polga@mics.msu.su
+7 495 939 40 54

Desert Research Institute,
2215 Raggio Parkway
Reno, NV 89512-1095
United States of America

January 21, 2013,

To whomsoever it may concern:

It is hereby certified that Prof. Shamsh Pervez, Professor of Chemistry, Pt. Ravishankar Shukla University, Raipur, CG, India is an in-kind collaborator on the following research grants funded by the NASA and the DRI EVPR Research Enhancement program:

Title:	Characterization of Wavelength Dependent Mineral Dust and Biomass Burning Aerosol Single Scattering Albedo for GLORY Retrieval of Aerosol Parameters
Duration:	January 1, 2011 – Dec 31, 2014
Sponsor:	NASA ROSES: GLORY SCIENCE TEAM
Funding:	$ 482,989
Title:	Building Research and Educational Capacity for Satellite Remote Sensing of Aerosols and their Radiative and Climate Change Impacts (Cooperative Agreement No. NNX10AR89A)
Duration:	August 13, 2010 – August 12, 2014
Sponsor:	NASA EPSCoR through Nevada System of Higher Education
Funding:	$ 1,125,000
Title:	Characterization of Emissions Resulting from Religious and Ritual-Based Activities in India
Duration:	May 1, 2011 – April 30, 2013
Sponsor:	DRI EVPR Research Enhancement Program
Funding:	$ 20,000

Prof. Pervez and his research group have been in charge of the following research tasks:

(A) Designing of study and sampling plan using established criteria of air monitoring.
(B) Sampling of Particulate Matter (PM) mass and volatile organic compounds in selected religious places and events of ritual/religious based activities viz. wedding ceremony using PM sampler and passive samplers for air organics.
(C) Simultaneous sampling of CO_2 and CO gases within the identified sampling site and defined atmospheric levels.
(D) Source apportionment studies, if found feasible.

Till date, this collaboration has resulted in three peer-reviewed publications – one submitted to *Science*, and the other two to *Chemosphere*. Additionally, several papers have already been presented in international climate change and air quality conferences/workshops.

IEECAS
Institute of Earth Environment
Chinese Academy of Sciences
10 Fenghui S. Rd., High-tech Zone
PO Box 17, Xi'an 710075 CHINA
Tel: +86 29 88326488
Fax: + 86 29 88320456

February 28, 2011

To whom it may concern

I am pleased to confirm our collaboration with the **School of Studies in Chemistry, Pt. Ravishankar Shukla University, Raipur, CG, India**, for research being proposed by **Dr. Shamsh Pervez, Associate Professor of Chemistry at and currently a Fulbright Fellow working** at the Desert Research Institute (DRI) in Reno, Nevada, USA. This collaboration includes: 1) working with professors and students at Pt. Ravishankar Shukla University on data analysis and publications; 2) sharing our IEECAS's research facilities with professors and students when they visit the China; and 3) seeking joint sponsorship for future research projects. IEECAS's analytical capabilities will be made available to externally-sponsored research projects on a cost-reimbursement basis to be mutually agreed upon.

We have appreciated working with Dr. Pervez during his current Fellowship and would look on this relationship as a model for future cooperative research.

Sincerely,

Prof. Junji Cao
President-Elect,
Chinese Academy of Sciences
IEECAS (Institute of Earth Environment, Chinese Academy of Sciences)
Email: jjcao@ieecas.cn

छत्तीसगढ़ CHHATTISGARH U 369231

Memorandum of Understanding

The CSIR-Indian Institute of Chemical Technology (IICT), Hyderabad hereby agrees to make Memorandum of Understanding between School of Studies in Chemistry and National Center for Natural Resources (NCNR) of Pt. Ravishankar Shukla University, Raipur for the collaborative work of mutual interest.

Further, the IICT, Hyderabad will meet all the financial expenditures arising due to this collaborative work.

All the research publications and patents emerged will be shared equally.

Prof. Keshari Lal Verma
(Vice-Chancellor, Pt. Ravishankar Shukla University, Raipur)

Prof. S. Chandrasekhar
(Director, CSIR-IICT, Hyderabad)

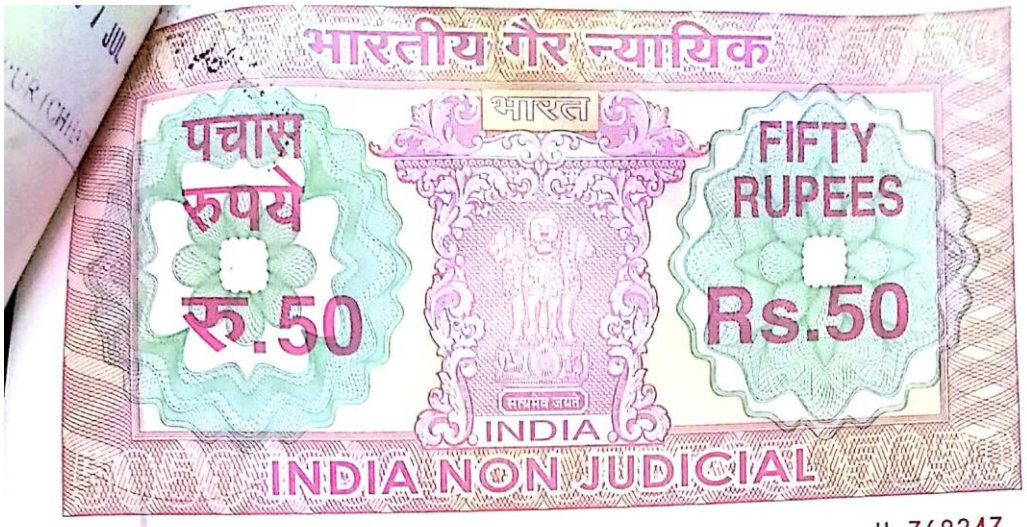
expenditure unless such expenditure has been agreed upon in writing between both the parties

Article VI

This MoU shall enter into force on the day of its signing and remain in force for a period of five years. Thereafter, it may be further extended automatically for subsequent periods of five years at a time, unless either of the Parties gives to the other a written notice six months in advance of its intention to terminate it before the date of its expiry.

Signed at Roorkee on this 20th day of August 2019 in two original copies in English

For the National Institute of Hydrology	For the Pt. Ravishankar Shukla University, Raipur
Dr. Renoj J. Thayyen	Prof. Girish Kant Pandey
(Name) Scientist E	(Name) Registrar
Designation	Designation



छत्तीसगढ़ CHHATTISGARH

U 369243

Article I

The parties shall work to enhance cooperation in research and capacity building at the national and regional levels in the field of earth, atmospheric & environmental sciences and water resources by collaboration and sharing of expertise on the areas mutually agreed upon including the development of Lightening Location Networking (LLN), evaluation of atmospheric carbonaceous matter over Indian regions and elsewhere and impact on regional climate change.

Article II

The Parties shall encourage exchange of experts and organize fieldwork, training programmes, study tours and other such activities jointly in order to build capacities in the areas referred to in Article I.

Article III

The Parties shall promote cooperation within the framework of joint activities mentioned in Article I through work plans to be drawn up by mutual agreement. Such activities could include a) Joint research projects b) Faculty exchange c)Sharing of R& D facilities d) Organizing Joint Conference/workshop/courses e) Joint Ph.D supervision etc. All the stated activities shall be within the operational rules and regulations of both the parties with mutual consent.

Cont.

DISTRICT TREA... RAIPUR (CH...

Article IV

A Working Group shall be formed, not later than three months of the signing of the MoU, comprising equal number of members from each of the Parties, which will monitor the activities to be carried out in fulfillment of the MoU. The Working Group shall endeavor to interact frequently through telephone, e-mail, and laboratory visits, etc.

Article V

Each party shall bear the respective costs of carrying out the obligations under this agreement. Neither party shall make a claim against the other party for any expenditure unless such expenditure has been agreed upon in writing between both the parties

Article VI

This MoU shall enter into force on the day of its signing and remain in force for a period of five years, Thereafter, it may be further extended automatically for subsequent periods of five years at a time, unless either of the Parties gives to the other a written notice six months in advance of its intention to terminate it before the date of its expiry.

Signed at----------on this ---------- day of---------- in two original copies in English

For the Indian Institute of Tropical Meteorology, India	For the Pt. Ravishankar Shukla University, Raipur
Suresh Tiwari 8/8/2019	8/8/2019
(Name) Designation	(Name) Designation
कार्यकारी अधिकारी OFFICER-IN-CHARGE भारतीय उष्णदेशीय मौसम विज्ञान संस्थान, पुणे INDIAN INSTITUTE OF TROPICAL METEOROLOGY, PUNE नई दिल्ली शाखा NEW DELHI BRANCH प्रो. रामनाथ विज मार्ग, आर. ब्लॉक PROF. RAM NATH VIJ MARG, R-BLOCK न्यू राजेन्द्र नगर, नई दिल्ली-110060 NEW RAJINDER NAGAR, NEW DELHI-110060	Vice-Chancellor Pt. Ravishankar Shukla University Raipur (C.G.)

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Government of Uttarakhand

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MEMORANDUM OF UNDERSTANDING
BETWEEN
THE NATIONAL INSTITUTE OF HYDROLOGY, ROORKEE (INDIA)
AND
PT. RAVISHANKAR SHUKLA UNIVERSITY, RAIPUR

This Memorandum of Understanding (MoU) is made between the **National Institute of Hydrology (NIH), Roorkee (India)** and **Pt. Ravishankar Shukla University**

V 709425

छत्तीसगढ़ CHHATTISGARH

Memorandum of Understanding (MoU)

The Chhattisgarh Council of Science and Technology (CCOST), Raipur hereby agrees to make Memorandum of Understanding (MoU) with Pt. Ravishankar Shukla University (PRSU), Raipur for the collaborative work of mutual interests. All the research publication and patents emerged will be shared equally.

R. Prasanna, IAS
(Director General)

24/8/2015
Prof. Keshari Lal Verma
(Vice Chancellor)

छत्तीसगढ़ CHHATTISGARH U 369244

MEMORANDUM OF UNDERSTANDING BETWEEN
THE INDIAN INSTITUTE OF TROPICAL METEOROLOGY, PUNE (INDIA)
AND
PT. RAVISHANKAR SHUKLA UNIVERSITY, RAIPUR

This Memorandum of Understanding (MoU) is made between the **Indian Institute of Tropical meteorology, Pune (India)** and **Pt. Ravishankar Shukla University (PRSU), Raipur,** hereinafter referred to as the 'Parties',

- Recalling mutual deliberations between both the Parties with a view to enhancing cooperation in the field of atmospheric process, Water Resources exploration, Development and Management and other related fields;
- Realizing that collaboration between IITM and PRSU would considerably leverage technical abilities of both the parties and enable a framework for professional education and research programs in field of earth, atmospheric & environmental sciences and water resources for the benefit of both the parties

Have reached the following understanding:

Cont.