

इंडियन इंस्टीट्यूट ऑफ टेक्नोलॉजी दिल्ली

हौज खास, नई दिल्ली -110016

(औद्योगिक अनुसंधान एवं विकास इकाई)

INDIAN INSTITUTE OF TECHNOLOGY DELHI

Hauz Khas, New Delhi-110016

(Industrial Research & Development Unit)

No. IITD/IRD/RP04455N/125379

Advertisement No.: IITD/IRD/039/2023

Dated:21/02/2023

Applications from Indian nationals are invited for Project Appointment under the following project. Appointment shall be on contractual basis with consolidated pay, renewable yearly or upto the duration of the project, whichever is earlier. निम्नलिखित परियोजना के तहत भारतीय नागरिकों से आवेदन आमंत्रित किए जाते हैं। अपॉइंटमेंट, अनुबंधित आधार पर समेकित वेतन, नवीकरणीय वार्षिक या परियोजना की अवधि तक, जो भी पहले हो, के साथ होगा.

1. Introduction Solid biomass fuel is used by about 40% of the global population and 50% of the Indian population to meet their daily energy needs [1-2]. In poor nations like India, traditional cookstoves are still commonly used. The by-products of their incomplete combustion, however, are damaging to the environment and must be vented [3]. Millions of lives are lost every year as a result of these poisonous pollutants. Women and children are disproportionately impacted by exposure to the harmful effects of cooking smoke from biomass inside, which can cause a variety of health problems, including acute respiratory ailments and cancer. They breathe in fine particulate matter from indoor cooking at concentrations up to 20 times greater than those advised by the World Health Organization [4]. An estimated 60% of the residential energy in India comes from biomass, much of it burnt in the traditional combustion devices called cookstoves (chulhas) which creates air pollution and hence, the adverse health and socio-economic implications. Every year, smoke from open fires and traditional stoves cause death of around 4.8 million people according to estimations from the World Health Organization (WHO, 2012). Also, the growing gap between availability and demand for firewood, coupled with the scarcity of fossil fuels, and the poor thermal performance and pollution caused by traditional stoves, has forced the technologists to focus their attention on improving the thermal efficiencies of these stoves and also to develop more efficient, smokeless stoves.

2. Job Profile Release of airborne particulate matter (PM) is a major environmental issue associated with biomass combustion. The World Health Organization (WHO) has issued recommendations for improving air quality, including setting an annual average limit of 20 micrograms per cubic metre of particulate matter (PM10). In India, 68% of the population lives in rural areas, and 0.2 billion people use fuel for cooking: 49% use firewood, 28.6% LPG, 8.9% cow dung cake, 2.9% kerosene, 1.5% coal, lignite, or charcoal, 0.4% biogas, 0.1% electricity, and 0.5% any other means. According to the Global Burden of Disease 2013 study, air pollution causes the deaths of approximately 5.5 million people every year. There are approximately 2.6 million persons who are exposed to indoor air pollutants. The leading causes of death among these people are ischemic heart disease (27%), chronic obstructive pulmonary disease (28%), lower respiratory infections (16%), and lung cancer (4%), in that order [1]. Burning crops in an open field is a major reason for changing the atmospheric chemistry in the nearby locations. Many hazardous pollutants are emitted from this uncontrolled and low-efficiency combustion. Around 13% of global emissions from agro-residue burning are particularly from India, affecting many people's lives yearly. More than 130 MT of agro-residue is subjected to in-situ burning annually in India. Also, the traditional cooking practice followed among rural communities across the globe with woody and unprocessed biomass in traditional cookstoves results in inefficient cooking, fuel wastage, and severe health hazards to the user by inhaling the smoke emitted from the cookstove. Thus, there is an urgent need to investigate these issues to utilise the waste biomass efficiently and protect the environment and people from the emissions of crop residue burning.

The selected candidate should be able to carry out detailed studies of heat and mass transfer for the biomass combustion devices for cooking and heating applications. This includes the testing using standard (BIS, ISO, etc.) protocols following different procedures such as, WBT, KPT, CCT, etc. for data collection and data analysis, writing research articles. The study also includes possible interventions such as, automation for primary and secondary air flow rates into the biomass combustion devices, simulation using suitable software and other technical work related to the project. \*Higher stipend may be offered for experienced/highly skilled/bright candidate.

p.t.o.

Title of the Project	Development and Demonstration of Clean Combustion Devices using Processed Biomass and Assessment of Potential Health and Environmental Benefits (RP04455N)	
Funding Agency	Swami Samarth Electronics Pvt.Limited, Nashik (Maharashtra) India	
Name of the Project Investigator	Prof. S.K. Tyagi [email id:sudhirtyagi@yahoo.com; tyagisk@iitd.ac.in]	
Deptt./Centre	Department of Energy Science and Engineering	
Duration of the Project	Upto:14/02/2025	
Post (s)	Consolidated fellowship / Pay-slab	Qualifications
Research Associate (1)	Rs.47,000-49,000-54,000/-p.m. (consolidated)	Ph. D. or M. Tech. with 3-5 years Research Experience (Thermal/Mechanical Engineering/Energy/Chemical having min 75% of marks at B. Tech and M. Tech. level) preferably having some experience in Chemical Analysis of Particulate Matter (for Chemical Engg. Background) and/or Design and Simulation through CFD (for Mech./Energy/Thermal Engg. Background).
Jr. Research Fellow (01)  OR Sr. Research Fellow (01)	Rs.31,000/-p.m. (consolidated) for JRF post  OR Rs.35,000/-p.m. (consolidated) for SRF post	M.Tech (Thermal/Mechanical Engineering/Energy/Chemical having min 75% of marks at B. Tech and M. Tech. level) with qualifying GATE* exam preferably having some experience in Chemical Analysis of Particulate Matter (for Chemical Engg. Background) and/or Design and Simulation through CFD (for Mech./Energy/Thermal Engg. Background). *The requirement of NET/GATE examination for the selection to the post of JRF/SRF may be relaxed for the candidates who have graduated from Centrally Funded Technical Institutes (CFTIs) with a CGPA of more than 8.000 (80% aggregate marks).  OR M.Tech (Thermal/Mechanical Engineering/Energy/Chemical having min 75% of marks at B. Tech and M. Tech. level) with qualifying GATE* exam and two years of research experience preferably having some experience in Chemical Analysis of Particulate Matter (for Chemical Engg. Background) and/or Design and Simulation through CFD (for Mech./Energy/Thermal Engg. Background). *The requirement of NET/GATE examination for the selection to the post of JRF/SRF may be relaxed for the candidates who have graduated from Centrally Funded Technical Institutes (CFTIs) with a CGPA of more than 8.000 (80% aggregate marks).
Project Assistant (Tech) (01)	Rs.25,000/-p.m. (consolidated)	B. Tech (Thermal/Mechanical Engineering/Energy/Chemical having min 75% of marks at B. Tech) with two years of working experience preferably having some understanding of Chemical Analysis of Particulate Matter (for Chemical Engg. background) and/or Design and Simulation through CFD (for Mech./Energy/Thermal Engg. background).

The candidates who are interested to apply for the above post should download **Form No. IRD/REC-4** from the IRD Website (<http://ird.iitd.ac.in/rec>) of IIT Delhi and submit the duly filled form with complete information regarding educational qualifications indicating percentage of marks/division, details of work experience etc. **by e-mail with advertisement No. on the subject line to Prof. S.K.Tyagi at email id: sudhirtyagi@yahoo.com; tyagisk@iitd.ac.in**

p.t.o.

IIT Delhi reserves the right to fix higher criteria for short-listing of eligible candidates from those satisfying advertised qualification and requirement of the project post and their name will be displayed on web link (<http://ird.iitd.ac.in/shortlisted>) **alongwith the online interview details. Only short-listed candidates will be informed for online interview.** In case any clarification is required on eligibility regarding the above post, the candidate may contact Prof. S.K.Tyagi at **email id:** sudhirtyagi@yahoo.com; tyagisk@iitd.ac.in 5% relaxation of marks may be granted to the SC/ST Candidates. In case of selection of a retired/superannuated government employee, his/her salary will be fixed as per prevailing IRD norms. अनुसूचित जाति / अनुसूचित जनजाति के उम्मीदवारों को अंकों की 5% छूट दी जा सकती है. एक सेवानिवृत्त सरकारी कर्मचारी के चयन के मामले में उसका वेतन वर्तमान आईआरडी मानदंडों के अनुसार तय किया जाएगा।

The last date for submitting the completed applications by e-mail is 07/03/2023 by 5.00 p.m.

*AD*  
*22/02/23*  
सहायक कुल्सचिव, आईआरडी

#### वितरण

- Head of the Deptt./Centres/Units : It is requested that the contents of the Above Advt. be brought to the notice of the staff working in your Deptt./Centre/Unit
- Webmaster, IRD : To put advertisement at IITD website.
- Notice Boards
- Advertisement file
- Prof. S.K.Tyagi, PI, Department of Energy Science and Engineering
- Copy to Chairperson, DRC/CRC