



## Memorandum of Understanding

Between

**Council of Scientific and Industrial Research (CSIR), India**

And

**Erlangen Graduate School in Advanced Optical Technologies (SAOT),  
Friedrich-Alexander-University Erlangen–Nuremberg (FAU), Germany**

And

**Lehrstuhl für Technische Thermodynamik (LTT),  
Friedrich-Alexander-University Erlangen–Nuremberg (FAU), Germany**

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This Memorandum of Understanding (MOU) has been entered into between:

**Council of Scientific & Industrial Research (CSIR)**, an autonomous body registered under the Registration of Societies Act XXI of 1860, having its principal place of business at Anusandhan Bhawan, 2, Rafi Marg, New Delhi, 110 001, through its constituent institute, the **Indian Institute of Petroleum** located at Mohkampur, Dehradun-248005, India (hereinafter referred to as 'IIP', which expression shall unless repugnant to the context thereof, include its successors and permitted assigns) of the **FIRST PART**

And

**Erlangen Graduate School in Advanced Optical Technologies** at the Friedrich-Alexander-University Erlangen–Nuremberg (FAU), Germany (hereafter referred to as **SAOT**) of the **SECOND PART**

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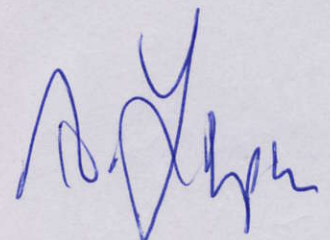
**And**

**Lehrstuhl für Technische Thermodynamik, Friedrich-Alexander-University  
Erlangen–Nuremberg (FAU), Germany (hereafter referred to as LTT) of the THIRD  
PART**

(Who for the purpose of this MoU are hereinafter individually referred to as 'Party' and collectively referred to as the 'Parties').

1. WHEREAS IIP is a premier research institute under CSIR, India. IIP has expertise in the field of petroleum refining, processing, chemicals and intermediates, catalysis, petroleum products application and training of personnel of related industries and has developed over the years experience and capabilities in these areas. Automotive Fuels and Lubricants Application Division (AFLAD) is one of the divisions of IIP. AFLAD is involved in carrying out research work in the area of internal combustion engines. It is working in the area of automotive fuel quality, engine combustion optimization, vehicle emissions and field studies.
2. WHEREAS SAOT is a major research and educational institution. SAOT in close collaboration with the LTT investigates the fundamentals and applications of internal combustion engines using optical diagnostic for the study of all different single steps forming the functioning chain of the engine process.
3. In view of the above background, the expertise of the three organizations, the common objective to have scientific collaboration for mutual benefit to carry out R&D work and the outcome of discussions held during November 2009 to January 2010 between the Parties, the Parties declare their intentions to cooperate as follows:

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### 3.1.1 Objective of Cooperation

To utilize mutual R&D facilities and expertise for scientific collaborative R&D work, training of scientific manpower amongst researchers of CSIR/IIP, SAOT and LTT.

### 3.1.2 Scope of Cooperation

The scope of cooperation would include any scientific work of mutual interest agreed upon by CSIR/IIP SAOT and LTT.

### 3.1.3 Areas of Cooperation

The areas of cooperation would include areas of mutual interest related to R&D work on automotive fuels, engines and vehicles including futuristic energy sources and particularly modern optical technologies for engine development.

### 3.1.4 Modes of Cooperation

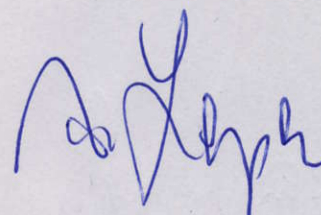
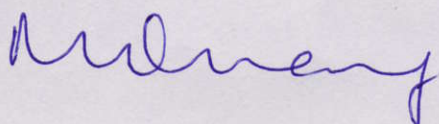
- Collaborative research projects;
- Exchange of research staff;
- Exchange of scientific information in the fields of mutual interest;
- Any other form of research cooperation by mutual agreement.

## 4. Funding of Cooperation

Cooperation would be carried out, subject to availability of funds and the approval of each institution.

The Parties shall jointly explore the possibility of receiving external funding through funding agencies such as German Academic Exchange Service (DAAD), German Research Foundation (DFG) etc. as and when their call for submission of projects arises. In India, there is already a mechanism provided by DST-DAAD and DST-DFG collaboration by which funding for exchange of scientists, utilization of mutual R&D facilities and for scientific R&D projects is available from time to time. This scientific collaboration between CSIR/IIP and SAOT/LTT would lead to formulation of collaborative R&D projects and proposals for mutual exchange of researchers and these projects and proposals can be submitted to DST-DAAD and DST-DFG for funding. By DST-DAAD and DST-DFG, funding is provided to both Indian and German counterparts.

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## 5. Review of Cooperation

The Parties shall regularly evaluate their collaborative research projects being implemented; make appropriate adjustments whenever problems occur, sum up the experience and seek more funding for developing new projects.

A Working Group comprising representatives of each Party for implementation of this MoU, is constituted. The following representatives are appointed as the members of the Working Group :

For IIP: Dr. Satish Singal and Mr. Amar Kumar Jain

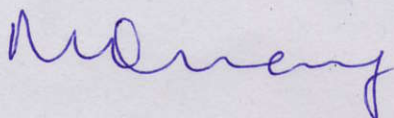
For SAOT & LTT: Prof. Dr. Alfred Leipertz and Prof. Dr. Michael Wensing

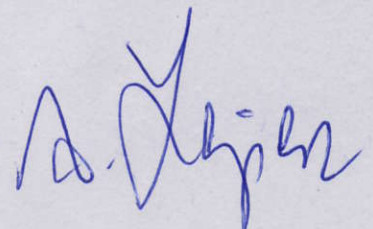
## 6. Joint Responsibilities of the Parties

- 6.1 The parties shall Identify specific subareas in each of the broad area for developing joint collaborative projects;
- 6.2 Formulate projects in the identified specific areas;
- 6.3 Identify the participants from each institution for implementing the specific projects / exploring new cooperation, decide the number and period of exchange visits;
- 6.4 Identify funding opportunities to procure resources for implementation of identified projects;
- 6.5 Develop project proposals as per the format of the respective funding agencies.
- 6.6 Develop human resources to support efforts.
- 6.7 Provide the most appropriate solution for both institutions to any arising problems.
- 6.8 Formulate, in mutual consultation, and execute detailed and definitive arrangement(s) in respect to individual projects detailing the rights and obligations of respective Parties and any other terms and conditions which the Parties may deem fit and necessary.

The participating organizations would ensure that their researchers visiting the other country has sufficient health and accident insurance.

All the participating organizations will disseminate the results of the collaboration via joint publications, seminars and meetings. In case of



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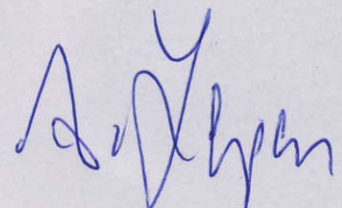
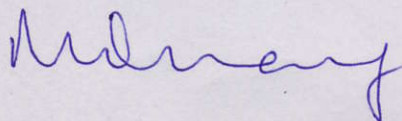


any Intellectual Property (IP)/ commercial benefits arising out of the cooperation or any other commercial benefit, all the participating organizations would share the same as per the mutually agreed terms, which would preferably be decided before undertaking the collaborative project/activity.

7. This MoU shall come into force on the date of signing by signatories of all the Parties and valid for an initial period of five years thereafter.
8. This MoU will be extended automatically for another year if none of the Parties states his interest to cease the MoU at least three months prior to the expiry of the validity of the MoU.
9. This MoU can be terminated by any Party with 30 days written notice to the other parties. However, any termination must take into account existing exchanges and cooperation programs which need to be completed.
10. Any amendment to be made to this MoU in order to be effective and binding shall be made in writing and signed by both the parties and shall be appended hereto.
11. All disputes, controversies or differences which may arise between the Parties out of or in relation to or in connection with this MoU or for breach thereof shall be settled through mutual consultations.
12. This MoU documents the relationship between the Parties to facilitate the objectives mentioned in Clause 3.

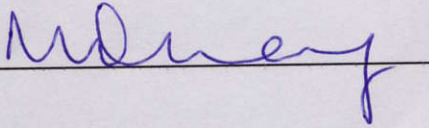
IN WITNESS whereof this MoU has been executed by the duly authorized representatives of CSIR/IIP, SAOT and LTT hereto on the 27<sup>th</sup> day of February, 2010 at CSIR Science Centre, Lodhi Estate, New Delhi.

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For CSIR/IIP India

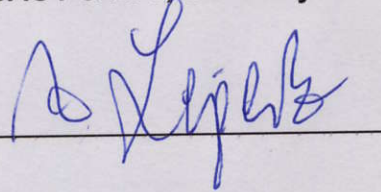
By: 

Name: Dr. M.O. Garg

Title: Director

Date: 27-Feb-2010

For SAOT & LTT, Germany

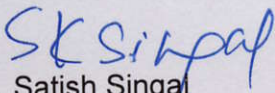
By: 

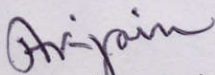
Name: Prof. Dr.-Ing. Alfred Leipertz

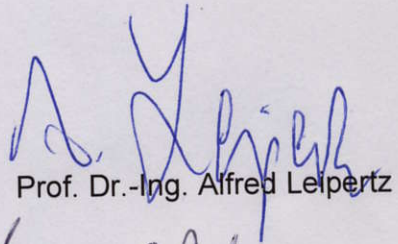
Title: Coordinator and Director

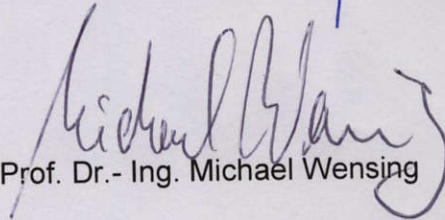
Date: February 27, 2010

The Scientific Coordinators:

  
Dr. Satish Singal

  
Mr. Amar Kumar Jain

  
Prof. Dr.-Ing. Alfred Leipertz

  
Prof. Dr.- Ing. Michael Wensing