

2011年9月5日-9日

ドイツ航空宇宙研究センターに協力してゲッチングで「感圧塗料講習会」を開催致します。

ドイツ航空宇宙研究センター (DLR) に協力して、2011年9月5日から9日まで、ドイツ・ゲッチング市において「感圧塗料講習会」(PSP Course 2011) を開催いたします。この講習会では大学や企業からの参加者を対象に、圧力を光学的に測定する感圧塗料 (PSP) の基礎と応用について講義と実習を行います。ゲッチング市には名門として知られるゲッチング大学があり、かつては本多光太郎先生や沼知福三郎先生も滞在されました。現在、ゲッチング大学では東日本大震災で被災した日本人学生に対する支援活動が行われており、今回の講習会には東北大から大学院生3名と学部生1名が招待されました。招かれた学生は講習会のほか、独日クラブのメンバーとの交流会やDLRでの研究発表会などに参加する予定です。講習会の講師をつとめる浅井教授は、今回のゲッチング訪問を、震災で延期となった「分子イメージング技術に関する日独共同セミナー」準備のための活動と位置づけており、DLRとは今後の協力強化についても協議する予定です。

浅井圭介 (事業担当者&航空宇宙工学専攻教授)

(参考)

- 感圧塗料講習会のホームページ <http://pspcourse.dlr.de/>
- ゲッチング大学の日本支援プログラム <http://www.uni-goettingen.de/en/209598.html>

**PSP Course 2011**

**Application of Pressure Sensitive Paint Theory and Practice, September 5-9, 2011**

**Application of PSP**

For investigations of pressure distributions on wind tunnel model surfaces with high spatial resolution, new experimental techniques such as Pressure Sensitive Paint (PSP) are required. Using the non-invasive optical pressure measurement technique, spatial structures and/or rapid temporal or spatial changes of aerodynamic phenomena (transition from laminar to turbulent flow, shocks on pitching airfoils in transonic flows, coherent structures etc.) can be investigated. Recently an increasing number of scientists and engineers has started to utilize the PSP technique to investigate pressure distributions in low speed, hypersonic and cryogenic wind tunnels, as well as in turbo machines. The PSP technique has also evolved from the measurement of steady state pressures to include both periodic and unsteady phenomena to study the instantaneous structure of pressure fields in various areas of fluid mechanics. This course, which is the fourth one on PSP organised by DLR Göttingen, Germany, will concentrate on both industrial measurement techniques and aspects of the theory of PSP relevant to applications. In addition to the presentation of practical and reliable solutions for problems faced during the implementation of the technique in wind tunnels and other test facilities. During practical sessions in the course, the participants will have the opportunity of carrying out experiments in small groups on paint characterisation, coating techniques, and the recording and evaluation of PSP data.

**Recent developments of the PSP technique will be discussed and demonstrated. In addition the application of Temperature Sensitive Paint (TSP), which is from the technical point of view very similar to PSP will be part of this course.**

**Lecturers**

Prof. Keisuke Asai, Tohoku University, Sendai, Japan, both having several years of experience in the field of PSP/TSP measurements and paint development, will present lectures on lifetime imaging technique and PSP/TSP for micro devices.

Alex Davies from BAE Systems, United Kingdom, will present basics and practical aspects of lifetime based PSP systems.

Prof. Dr. Yasuhiro Egami, Aichi Institute of Technology (AIT), who worked at DLR for several years, will give information about TSP development and application.

Dr. Yousef Melsark, National Research Council, Canada, will present a theoretical background on the Pressure Sensitive Paint.

Marie-Claire Maréchal from ONERA, Meudon, France, who has worked for more than 10 years in the field of PSP development, will give detailed information about advanced techniques such as corrections for self illumination, temperature etc. and will also speak about unsteady PSP.

Dr. Václav Ondrus, Universitat Hohenheim, Germany, will discuss chemical aspects and development of PSP compositions in his lecture.

Dr. Ulrich Henne, Institute of Aerodynamics and Flow Technology, DLR Göttingen, will organise the PSP course.

Dr. Rolf H. Engler, who had performed research and development

**In PSP for almost 20 years will start the lectures with a general overview of the existing PSP systems and techniques. Together with Dr. Walter Beck, Dr. Christian Kien, and Dr. Werner Scholz, the other lecturers will present their knowledge and experience in different areas of the PSP technique: calibration techniques, CO2-camera, recording, evaluation, combination of PSP with other techniques, unsteady PSP, and calculation of losses using PSP.**

**Schedule (preliminary)**

Registration will begin at 8:00 h on Monday, September 5, 2011 in the Lecture Room of Building 7. Lectures (4 half days) and experiments and demonstrations in the laboratory (5 half days) will run from 8:30 h to 12:00 h from Monday to Friday and from 13:30 h to 17:00 h from Monday to Thursday, respectively. All presentations will be given in English. The course will end on Friday at 14:00 h.

**Course outline (preliminary)**

**Monday, September 5, 2011**  
Registration. Welcome by Dr. Jürgen Kompenhans, Head of Department Experimental Methods of the DLR Institute of Aerodynamics and Flow Technology.  
**Principles of PSP technique:** General overview, physical and historical background, existing systems, paint types and properties, intensity system and data evaluation, theoretical basis for PSP, light sources.

**Tuesday, September 6, 2011**  
**Principles:** Camera systems, advanced techniques (from angular effects, deformation to pixel size calibration).  
**Applications:** Lifetime imaging and PSP/TSP for microdevices.  
**Practice I.**

**Wednesday, September 7, 2011**  
**Principles:** Basics of unsteady PSP  
**Applications:** Unsteady PSP at Tohoku University, ONERA and DLR, enhanced flow visualisation of PSP results.  
**Practice II.**

**Thursday, September 8, 2011**  
**Principles:** Basics of Temperature Sensitive Paint (TSP).  
**Practice III and IV.**

**Friday, September 9, 2011**  
**Principles:** Basics of PSP technique, final discussion and assessment.

**Practical sessions (preliminary)**

PSP coating procedure, characterisation of paint samples, adjustment and data acquisition, lifetime scanning system, data evaluation.

**Course material**

A complete set of course notes will be distributed to the participants at registration.

**Course registration**

Prerequisite is required due to limited number of places in the laboratory. Online registration at <http://pspcourse.dlr.de> is desired. The registration fee of 550 EURO includes course notes, lunches and refreshments during the course. For payments received before July 1, 2011, a reduced registration fee of 550 EURO applies. The fee for participation is free of VAT as far as the German Umsatzsteuergesetz (UStG) is concerned. The organisers reserve the right to cancel the course in case of insufficient registration. A cancellation fee of 200 Euro will be charged from registered persons who cancel their participation after August 15, 2011.

**General information**

The latest information about the PSP course can be found at: <http://pspcourse.dlr.de>

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**Organised by**

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