

european powder
metallurgy association



EPMA Powder Metallurgy Summer School 2013

A Residential Summer School for
Young Materials and Design
Engineers



Piazza Duomo

Participation Fee €575 per person

8th - 12th July 2013

Trento, Italy



www.epma.com/summerschool

EPMA

Powder Metallurgy Summer School

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The EPMA Summer Schools have been designed to offer participants from all parts of the EU an advanced teaching of PM's advantages and limitations by some of the leading academic and industrial personnel in Europe.

It is also a rare opportunity to stimulate direct technical discussions by young scientists and engineers who are interested in broadening their knowledge through interaction with senior figures in the PM industry.



Students in Classroom

Powder Metallurgy

Powder Metallurgy (PM) is the generic name for a series of related processes where powders are compacted into components of the desired shape and then the compacts are strengthened by sintering at high temperature in excess of 1100°C.

PM can utilise a range of materials including steels, non-ferrous metals, friction and anti-friction materials, high porosity materials and filters, hard materials and cemented carbides, magnets and materials for electronic applications.

PM Summer School 2013 Programme

The programme consists of a 5-day Summer School from Monday, 8th July until Friday, 12th July 2013. The 2013 Summer School will be coordinated by Prof José Torralba from the Universidad Carlos III de Madrid together with Prof Alberto Molinari and his team from the University of Trento. All lectures and laboratory work will take place at the University.

Who Should Attend ?

The events are particularly designed for young graduate designers, engineers and scientists drawn from a wide range of disciplines such as materials science, design, engineering, manufacturing or metallurgy. All will benefit from an in depth overview of PM presented in the course. The Courses will all be presented in English and will provide a valuable opportunity to improve attendees' knowledge of the current status of PM technology. The course is open to graduates under the age of 35 who have received their degrees from a European university.



Engineering Faculty

Fees and benefits

The participation fee for the whole event is a very reasonable €575 per person. For this non-refundable fee participants will receive all relevant course documents plus refreshments, meals and accommodation. **Please note all accommodation is shared in twin bedded double rooms.** The fee also includes 18 months' Student membership of the EPMA which enables members to obtain discounted rates at the Euro PM2013 Congress & Exhibition to be held 15th – 18th September in Gothenburg, Sweden, amongst other benefits.

Location

The event is being held at:

University of Trento

Via Mesiano 77, 38123, Trento, Italy

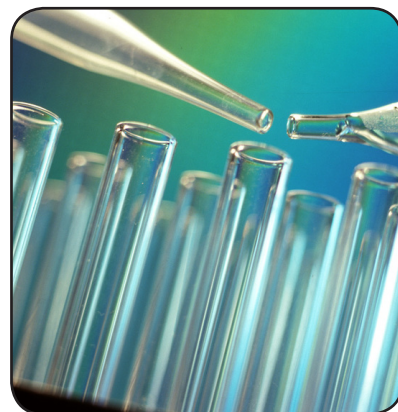
W: www.unitn.it/en

T: +39-0461-282402

For travel details and other information please visit the EPMA website at www.epma.com/summerschool (Travel costs are not included in the course fee).

How to apply

Please apply online no later than 12th April 2013 at: www.epma.com/summerschool to reserve a place. Remember these courses are highly likely to be over-subscribed so past Summer School attendees need not apply as priority will be given to those applicants who have not previously attended. Applicants will be advised week beginning 15th April 2013 if they have been successful in gaining a place and payment details will be sent at that time.



Mon 8th July

09.00 - 09.30 Registration for Summer School

- 10.00 - 11.15 **Introduction to Materials Science**, Prof Alberto Molinari, University of Trento
- 11.15 - 11.30 **Refreshments**
- 11.30 - 11.50 **Presentation of the EPMA**, Dr Olivier Coube, EPMA
- 12.00 - 12.50 **Introduction to PM**, Prof José M Torralba, Universidad Carlos III de Madrid
- 13.00 - 14.00 **Lunch**
- 14.00 - 15.50 **Case Studies**, Dr Enrico Mosca, Consultant
- 15.50 - 16.10 **Refreshments**
- 16.10 - 17.00 **Powder Manufacturing**, Dr Brian James, Hoeganaes Corp
- 17.10 - 18.00 **Powder Characterization**, Dr Ulf Engström, Höganäs AB
- 20.00 **Welcome Reception**

Tues 9th July

- 09.00 - 09.50 **Shaping Technologies**, Mr Norbert Nies, SMS Meer GmbH
- 10.00 - 11.30 **Student Presentations**, Prof José M Torralba, Universidad Carlos III de Madrid
- 11.30 - 11.50 **Refreshments**
- 11.50 - 12.40 **Sintering Fundamentals**, Prof Bernd Kieback, IFAM/Dresden University
- 12.40 - 14.00 **Lunch**
- 14.00 - 14.50 **Liquid Phase Sintering**, Dr Cinzia Menapace, University of Trento
- 15.00 - 15.50 **Atmosphere/Material Interaction**, Dr Christian Gierl, Vienna University of Technology
- 15.50 - 16.10 **Refreshments**
- 16.10 - 17.00 **PM Light Alloys**, Dr Thomas Weissgärber, Fraunhofer Institut IFAM Dresden
- 17.10 - 18.30 **Student Presentations**, Prof José M Torralba, Universidad Carlos III de Madrid

Wed 10th July

- 09.00 - 09.50 **Introduction to MIM**, Dr Marco Actis Grande, Politecnico di Torino
- 10.00 - 10.50 **New Developments in MIM**, Dr Frank Petzoldt, IFAM Bremen
- 10.50 - 11.10 **Refreshments**
- 11.10 - 12.00 **Magnetic Materials**, Dr Mark Dougan, AMES SA
- 12.10 - 13.00 **Advanced Methods in PM**, Prof Lars Nyborg, Chalmers University of Technology
- 13.00 - 14.00 **Lunch**
- 14.00 - 15.50 **Laboratory Work/Problem Solving**, Dr Bob Moon, Consultant
- 15.50 - 16.10 **Refreshments**
- 16.10 - 18.30 **Laboratory Work/Problem Solving**, Dr Bob Moon, Consultant

Thurs 11th July

- 09.00 - 09.50 **Finishing Operations in PM Steels**, Dr Mónica Campos, Universidad Carlos III de Madrid
- 10.00 - 10.50 **PM Steels I**, Prof Francisco Castro, CEIT
- 10.50 - 11.10 **Refreshment**
- 11.10 - 12.00 **PM Steels II**, Prof Herbert Danninger, TU Vienna
- 12.10 - 13.00 **Effect of Porosity on Properties**, Prof Giovanni Straffelini, Trento University
- 13.00 - 14.00 **Lunch**
- 14.00 - 14.50 **Hot Isostatic Pressing**, Dr Anders Eklund, Avure Technologies AB
- 15.00 - 18.00 **Factory Visit**
- 20.00 **Summer School Dinner**

Fri 12th July

- 09.00-09.50 **Titanium Alloys**, Mr Mario Zadra, K4Sint srl
- 10.00-10.50 **Hardmetals**, Dr Leo Prakash, WTP Materials Engineering
- 10.50-11.10 **Refreshment**
- 11.10-12.00 **Modelling I**, Dr Torsten Kraft, Fraunhofer Institut - IWM
- 12.10-13.00 **Modelling II**, Dr Luc Federzoni, CEA
- 13.00-14.00 **Lunch**
- 14.00 **END OF SUMMER SCHOOL**

The programme may be subject to change

Location

The city of Trento was formally founded in the first century B.C. by the Romans, with the Latin name of “Tridentum”. Extensive remains of the ancient settlement can still be seen today. Trento is set on the intersection of important roads leading to Lake Garda, the Dolomites, Venice, Verona, Bolzano and Innsbruck. It is dominated by the nearby Bondone and Paganella Mountains, where the residents and tourists go skiing and hiking. Trento has a wealth of history, which is reflected in its fine architecture. At the heart of town is Piazza del Duomo, with its baroque fountain devoted to Neptune, the mythological god of the sea.

Travel / Directions

By Air

Trento is connected with the main airports by the A22 Brennero Motorway and by the railway: 90 Km from Catullo Airport (Verona), about 200 km from Venice (Marco Polo) and Bergamo (Orio al Serio) airports, 245 km from Linate Airport (Milan), 265 from Malpensa Airport (Milan) and 60 km from the new airport in Bolzano.

A shuttle service to reach the centre of **Milan** is guaranteed for travellers arriving in Malpensa (Malpensa Airport) and Linate (Linate Airport). Buses leave every 20-30 minutes 24 hours a day.

For those arriving in **Verona** (Valerio Catullo airport) or Brescia (Montichiari Airport) there is a shuttle bus service to Verona Porta Nuova railway station every day, leaving every 20 minutes from 6.30 in the morning until 11.35 p.m. Tickets can be bought either in the airport or in the bus, price 6 euros. From Verona Porta Nuova, take a direct train to Trento which is the stop after Rovereto, but the final destination of the train could be Bolzano/Brennero/Trento/München(Germany)

For those arriving in **Bergamo** (Orio al Serio airport) there is a shuttle bus service to Bergamo railway station, leaving every 15 minutes from 6.05 a.m. to 00.15 a.m.; to Milano Centrale railway station leaving every 20 minutes from 04.30 a.m. to 01.00 a.m. and to Brescia railway station.

For those arriving in **Venice** (Marco Polo Airport) there are buses to Venezia-Santa Lucia and Mestre-Venezia railway stations. For those arriving in Bolzano (ABD Airport), no connection to the airport with public city buses. The nearest bus stop is 600m from the airport (Line 10A or 10B). You can then reach Trento by train.

By Train

If you reach Trento by train, check the timetable on “Ferrovie dello Stato” website. Trento railway station is in Piazza Dante - T: +39 0461 891411 - 166 105050.

Please note that you always have to change train in Verona (to go to Trento the direction is Brennero/Monaco) and that there are no train connections after 11.00 p.m. until 05.00 a.m.

If you are coming from Austria or Germany, check “Deutsche Bahn” or “OBB” website.

Ferrovie dello Stato - www.trenitalia.com

Deutsche Bahn - www.bahn.com/i/view/index.shtml

OBB - www.oebb.at

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Piazza Duomo, Metinoz

Classroom picture, C Buffa

Engineering Faculty, Fototonina

Application Deadline: 12th April 2013