

# ICRF

Ingot Casting Rolling Forging 2014

2<sup>nd</sup> International Conference



## INGOT CASTING ROLLING & FORGING

Milan · Italy, 7-9 May 2014

### Advanced programme

Organized by



ASSOCIAZIONE ITALIANA  
DI METALLURGIA

Patronized by



AIPnD



Federacciai



## Conference chairmen

Jacopo Guzzoni - CEO at FOMAS Group, Italy

Michael Manning - GE Power & Water, USA

## Scientific & Steering Committee

Giuseppe Abbruzzese - CSM, Italy

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Franco D'Aste - New Tons "steel experts", Italy

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Michele Formentelli - M&M Forgings, Italy

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Livio Marietti - UNISA, Italy

Franco Milani - Italy

Marco Roveda - Siemens, Italy

Pál Tardy - MVAE Hungarian Steel Association, Hungary

## Organising Committee

Federica Bassani - AIM, Italy

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Ottavio Lecis - AIM, Italy

Francesco Magni - Danieli, Italy

Gabriele Rampinini - Forgiatura A. Vienna, Italy

Pietro Ravanelli - TenarisDalmine, Italy

## Cooperating organizations

- Austrian Society for Metallurgy and Materials
- Brazilian Metals and Materials Association
- Centro Nacional de Investigaciones Metalúrgicas
- Centre de Recherches Métallurgiques
- The Chinese Society for Metals
- Croatian Metallurgical Society
- Czech Steel Federation
- DVM, German Association for Materials Research and Testing
- Fédération Française de l'Acier
- Hungarian Mining & Metallurgical Society
- The Institute of Materials, Minerals and Mining
- International Stainless Steel Forum
- The Iron and Steel Institute of Japan
- Jernkontoret
- The Minerals, Metals & Materials Society
- Société Française de Métallurgie et de Matériaux
- Steel Institute VDEh

## About ICRF

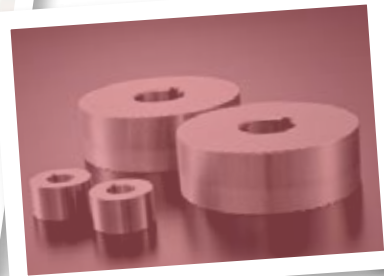
*In 2009, AIM organized the 1<sup>st</sup> International Conference Hot Forming of Steels & Product Properties, in Grado. Three years later, the Steel Institute VDEh held the 1st International Conference Ingot Casting, Rolling & Forging, in Aachen.*

*These two successful experiences induced AIM to organize the 2<sup>nd</sup> ICRF, that will provide a forum for researchers and manufacturers involved in the scientific and technical developments of ingot casting production, from conventional ingot casting to the remelting processes, to obtain improved steel cleanliness.*

*ICRF2014 will also focus on rolling and forging technologies: rolling manufacturers, forge masters and end-users will present current and future challenges for steelmakers, as well as new developments in forming technology, simulation and testing.*

*This meeting is aimed at creating an opportunity for a technical exchange at an international level among the numerous experts involved in the specific and strategic hot forming production route: steelmakers and producers of semis (ingots, blooms, billets etc.), forming operators, designers of plastically formed products, research centers and laboratories engaged in quality control and in innovation activities.*

*The decision to include the entire technological route is intended to favor a fruitful discussion and interaction among the different realities, and it will offer a good opportunity to improve quality, performance, efficiency, safety qualification procedures and the preparation of reference standards for hot forming process and plastically deformed products. During the Conference, thanks to the cooperation with Siderweb.com, the attendees will have the opportunity to follow a session devoted to market issues, called "Steel Market Outlook".*



# Wednesday, 7 May 2014

8.00 Registration

## Room VOLTA

### OPENING SESSION

CHAIRPERSON: **Carlo Mapelli**  
- *Politecnico di Milano, Italy*

9.00 Welcome addresses by:  
AIM President  
Dr. Jacopo Guzzoni - *Conference  
Chairman*

9.40 **Steel applications and  
challenges in the power  
generation industry**  
C. Manning - *GE Oil & Gas, USA*

10.10 **Electroslag Remelting  
of large ingots: characterization  
of hot topping morphology  
and prediction of defects evolution  
during forging by finite elements  
simulation**  
V. Vicario, F. Malagoli - *FOMAS Group,  
Osnago, Italy*

10.40 **Design and application  
of an advanced fast rolling model  
with through thickness resolution  
for heavy plate rolling**  
J. Lohmar, M. Bambach, G. Hirt  
- *RWTH Aachen University, Germany*  
S. Seuren - *AG der Dillinger  
Hüttenwerke, Dillingen/Saar, Germany*

11.10 Coffee break offered by



& *Opening of the exhibition*

### ROLLING & FORGING Open Die Forging

CHAIRPERSON: **Paolo Ferro**  
- *Università di Padova/Vicenza, Italy*

11.40 **Effect of aluminum nitride  
on the hot ductility of as-cast  
forging ingots**  
B. Connolly - *Ellwood Quality Steels  
and University of Pittsburgh, USA*

12.00 **Analytic and experimental study  
of pre-forging heating process  
of big dimensions steel blocks**  
A. Dal Santo, M. Longin - *Siderforgerossi, Arsiero, Italy*  
P. Ferro, F. Bonollo - *Università  
di Padova - DTG, Vicenza, Italy*

12.20 **New developments for ingots  
of alloyed steel and alloys  
forging between four dies on  
open-die forging presses**  
V. Lazorkin, D. Lazorkin - *FDforging  
Ltd., Zaporozhye, Ukraine*

12.40 Lunch

## Room VOLTA

### ROLLING & FORGING Simulation 1

CHAIRPERSON: **Bruno Buchmayr**  
- *Montanuniversität Leoben, Austria*

**14.10 The effect of forging and heat treatment conditions on the service life expectancy of a component working at high temperature and high pressure**

L. Casiraghi, A. Corsi, G. Merckling,  
G. Billi - *RTM Breda, Cormano, Italy*  
D. Suzzani - *Bassi Luigi & C.,  
S. Rocco al Porto, Italy*

**14.30 A sigma particles dissolution model with application to duplex and superduplex stainless steels forged components**

P. Ferro, F. Bonollo - *Università  
di Padova - DTG, Vicenza, Italy*  
M. Longin - *Siderforgerossi, Arsiero, Italy*

**14.50 Optimization of the quality of heavy plates through the mastery of the modelisation of deformation**

L. Coudreuse, B. Pierre, Y. Jan - *Industeel  
Loire, ArcelorMittal, France*  
I. Poitroult, J. Dairon - *Industeel CRMC,  
ArcelorMittal, Le Creusot, France*

**15.10 Application of Finite Element Analysis considering the complex tool kinematics in axial-profiling in ring rolling**

G. Schwich, J. Seitz, G. Hirt  
- *RWTH Aachen, Germany*  
V. Jenkouk - *University of Cambridge,  
United Kingdom*

**15.30 Design and optimisation of closed die counter blow forging process by finite element method**

C. Gorwade, D. Legge, S. Hassan,  
A. Smith - *Sheffield Hallam University,  
United Kingdom*  
B. Hanson, L. Saunders, D. Hall  
- *Chapmans Agricultural Ltd.,  
United Kingdom*

**15.50** Coffee break

### INGOT CASTING Simulation 1

CHAIRPERSON: **Silvia Barella**  
- *Politecnico di Milano*

**16.20 CFD modelling of macro-segregation and shrinkage in large diameter steel roll castings using an active heating technology**

L. Nastac - *The University of Alabama,  
Tuscaloosa AL, USA*  
K. Marsden - *Whemco Inc.,  
Pittsburgh PA, USA*

**16.40 Nb microsegregation and redistribution during casting and forging in Al-free case hardening steel**

S. Konovalov, U. Prah1 - *RWTH Aachen,  
Germany*

**17.00 Casting and solidification parameters optimization of large forging ingots**

S. Barella, C. Di Cecca, A. Gruttadauria,  
C. Mapelli, D. Mombelli - *Politecnico  
di Milano, Italy*

**17.20 Effect of solidification microstructure on the formation of channel segregation in the steel ingot**

Y. Yamashita - *Nippon Steel & Sumitomo  
Metal Corporation, Ibaraki, Japan*

**17.40 Optimization of the filling and solidification of large ingots**

K. Marx, S. Rödl - *VDEh -  
Betriebsforschungsinstitut, Düsseldorf,  
Germany*  
S. Schramhauser, M. Seemann - *Buderus  
Edelstahl, Wetzlar, Germany*

**18.00** End of the first day

## Room VERDI

**14.10 STEEL MARKET OUTLOOK  
by**

**siderweb.com**  
il portale della siderurgia

Thursday 8 May 2014

Room VOLTA

**INGOT CASTING  
Remelting 1**

CHAIRPERSON: **Gabriele Rampinini**  
- *Forgiatura A. Vienna, Italy*

**9.00 Electric current distribution in the ESR process and its relation to the ingot surface quality**  
A. Kharicha, E. Karimi Sibaki, M. Wu, A. Ludwig - *University of Leoben, Austria*

**9.20 Simulation of solidification and fluid flow behaviour in the ESR process for industrial scale ingots**  
N. Giesselmann, A. Rückert, H. Pfeifer - *RWTH Aachen, Germany*  
J. Tewes, J. Klöwer - *ThyssenKrupp VDM, Germany*

**9.40 Large ESR forging ingots and their quality in production**  
P. Bettoni, A. Paderni - *ASO Siderurgica, Ospitaletto, Italy*  
H. Scholz, U. Biebricher, H. Franz - *ALD Vacuum Technologies, Hanau, Germany*

**10.00 Increase of the forging ingot mass-how far**  
L. Medovar, G. Stovpchenko, A. Sybir - *Elmet-Roll, Kyiv, Ukraine*

**10.20 Introducing an analytic approach on air gap formation during the ESR / VAR process and numerical validation**  
M. Eickhoff, N. Giesselmann, A. Rückert, H. Pfeifer - *RWTH Aachen, Germany*  
J. Tewes, J. Klöwer - *ThyssenKrupp VDM, Germany*

**10.40** Coffee break

**ROLLING & FORGING  
Technology**

CHAIRPERSON: **Marco Roveda**  
- *Siemens, Italy*

**11.10 The impact of processing parameters associated with hot rolling of thin slabs for high strength-high toughness combination niobium-microalloyed steels**  
D. Misra - *University of Louisiana, Lafayette, USA*

**11.30 Optimized roll-materials for the hot rolling of high strength alloys**  
H. Zunko, S. Zinner - *Böhler Edelstahl GmbH & Co KG, Kapfenberg, Austria*

**11.50 High-performance cutting facilities for increasingly large material cross sections**  
G. Richter - *BRAUN Maschinenfabrik GmbH, Vöcklabruck, Austria*

**12.10 Rolling of HE390 D grade with high strength low alloy steel**  
S. Pourmostadam - *Mobarakeh Steel Company, Esfahan, Iran*

**12.30 Customised handling in forging and heat treatment**  
R. Dango - *Dango & Dienenthal Maschinenbau GmbH, Siegen, Germany*

**12.50** Lunch

## Room VOLTA

### INGOT CASTING Additives & refractories development

CHAIRPERSON: **Reinhard Fandrich**  
- *Stahlinstitut VDEh, Germany*

**14.20 Discussion of fly ash compared to synthetic mould powders – time for change?**

L. Hallgren, C-Å. Däcker  
- *Swerea KIMAB AB, Sweden*  
L. Teng - *Royal Institute of Technology, Sweden*

**14.40 Experience from plant trials with improved mould powder at Uddeholms AB**

M. Svensson, E. Sjöqvist Persson - *Uddeholms AB, Hagfors, Sweden*  
L. Hallberg, C-Å. Däcker - *KIMAB, Sweden*

**15.00 Ingot feeding systems: analysis of fibers' behaviour before/after casting**

F. Sola - *Jodovit, Lonate Pozzolo, Italy*  
C. Mapelli, D. Mombelli - *Politecnico di Milano, Italy*

**15.20 High- quality refractories for high- quality steel**

W. Schoenwelski, K. Ruwier, S. Foellbach, J. Sperber - *Steuler-KCH GmbH, Hoehr-Grenzhausen, Germany*

**15.40 Recent developments and new challenges on refractory materials and on shape design for Hollowware**

R. Rettore, E. Guéguen, T. Avelar, M. Yanakiev, F. Pastorino, G. Zieba - *Magnesita Refractories GmbH, Kruf, Germany*

**16.00** Coffee break

### INGOT CASTING Remelting 2

CHAIRPERSON: **Matteo Marten-Perolino**  
- *Cogne Acciai Speciali, Italy*

**16.30 A parameter study on the effect of slag electric conductivity on the solidification of a large scale ESR ingot**

E. Karimi Sibaki, A. Kharicha, M. Wu, A. Ludwig - *University of Leoben, Austria*  
H. Holzgruber, B. Ofner, M. Ramprecht - *INTECO Special Melting Technologies GmbH, Bruck/Mur, Austria*

**16.50 Quality and efficiency of ESR ingots production**

L. Medovar, V. Petrenko, S. Artem, G. Stovpchenko - *Elmet-Roll, Kyiv, Ukraine*

**17.10 State of the art in VAR and ESR processes – A comparison**

H. Scholz, U. Biebricher, H. Franz - *ALD Vacuum Technologies GmbH, Hanau, Germany*  
A. Paderni, P. Bettoni - *ASO Siderurgica, Ospitaletto, Italy*

**17.30 The behavior of inclusions during ESR remelting**

E. Sjöqvist Persson - *Uddeholms AB, Hagfors, Sweden*  
H. Fredriksson - *KTH, Sweden*  
A. Mitchell - *UBC*

**19.00-22.30  
SOCIAL EVENT**

Cocktail and visit to the "Last supper" by Leonardo  
Symphony Concert at Basilica of Sant'Ambrogio

Thursday 8 May 2014

Room VERDI

**INNOVATIVE MATERIALS  
& APPLICATIONS**

CHAIRPERSON: **Valentina Vicario**  
- FOMAS Group, Italy

- 9.00 Experience in manufacture and behaviours of high chromium forged rotor steels**  
A. Di Gianfrancesco, S. Budano,  
P. Lombardi, M. Paura - *Centro Sviluppo Materiali, Roma, Italy*  
S. Neri, M. Calderini - *Società delle Fucine, Terni, Italy*
- 9.20 The effect of nitrogen on the hot strength of high nitrogen steels**  
R. Ritzenhoff, M.M. Gharbi, V. Diehl,  
A. Hahn - *Energietechnik Essen GmbH, Essen, Germany*
- 9.40 Laser welding simulation on ITER TF coil Double Pancake**  
F. Lucca, A. Marin, M. Marconi,  
M. Manzoni, S. Beretta, F. Viganò  
- *L.T. Calcoli, Merate, Italy*  
A. Foussat - *ITER Organization, St. Paul lez Durance Cedex, France*
- 10.00 Technology of high-strength wire obtaining of corrosion resistant steels**  
L.A. Maltceva, N.N. Ozerets,  
T.V. Maltceva, A.V. Levina,  
V.A. Sharapova - *URFU, Yekaterinburg, Russia*
- 10.20 Advanced radial forging machines from SMS Meer**  
P.-J. Nieschwietz - *SMS Meer GmbH, Moenchengladbach, Germany*
- 10.40** Coffee break

**ROLLING & FORGING  
Measurement & Testing**

CHAIRPERSON: **Giovanni Fantini**  
- M&M Forgings, Italy

- 11.10 Study on the microstructure influence in ultrasonic test in duplex forged components**  
S. Barella, C. Di Cecca,  
A. Gruttadauria, C. Capelli,  
D. Mombelli - *Politecnico di Milano, Italy*  
C. Fanezi Da Rocha, T. Strohaecker  
- *Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil*  
G. Fantini, M. Guarneri - *M&M Forgings, Cividate Camuno, Italy*
- 11.30 Aging effect on 15-5PH ESR steel**  
R. Sola, P. Veronesi, G. Poli - *Università degli Studi di Modena e Reggio Emilia, Italy*  
S. Ferrari - *Acciaieria di Rubiera, Italy*
- 11.50 Investigation on the final microstructure and mechanical properties of S355 steel plates produced by three hot rolling methods**  
R. Abdideh, M. Hizombor,  
B. Ehdai - *Khuzestan Oxin Steel Co., Ahvaz, Khuzestan, Iran*
- 12.10 Automatic ultrasonic testing of heavy-duty premium steel bars**  
W. Deutsch - *KARL DEUTSCH Prüf- und Messgerätebau GmbH + Co KG, Wuppertal, Germany*  
F. Hippenstiel, D. Jung,  
R. Jungermann - *BGH Edelstahl Siegen GmbH, Siegen, Germany*
- 12.30 Dimensional control during forging: innovative 3d laser measuring system**  
E. Libralesso, A. Gaspari,  
E. Guerra - *Tecnogamma (Mermec Group), Italy*
- 12.50** Lunch



## Room VERDI

### ROLLING & FORGING Simulation 2

Chairperson: **Andrea Corsi**  
- RTM Breda, Italy

**14.20 Analysis of pore closure in open die forging by experimental and numerical simulation**

D. Rosenstock, A. Melzner,  
G. Hirt - RWTH Aachen University,  
Germany

**14.40 Innovative approach to calculate lamination curves in ring rolling operations through simulation**

A. Sartori - Muraro, Italy  
P. Lasne - Transvalor S.A., France  
M. Gabrielli - Enginsoft, Italy

**15.00 Process chaining approach with simulation: from cast ingot to final properties of forged component**

L. Valente, C. Viscardi - Ecotre,  
Brescia, Italy

**15.20 Numerical simulation of a shell forming, from hollow ingot to the final product, with a powerful software tool**

O. Jaouen, F. Costes, P. Lasne,  
C. Fourment, M. Barbelet - Transvalor  
S.A., Mougins, France

**15.40 Quality prediction with combined simulation of ingot casting and forging**

I. Hahn, M. Schneider - Magma  
Gießertechnologie GmbH, Aachen,  
Germany  
H. Schafstall, C. Barth - Simufact  
Engineering GmbH, Germany

**16.00** Coffee break

### INGOT CASTING Simulation 2

Chairperson: **Michele Formentelli**  
- M&M Forgings, Italy

**16.30 Characterization and forecasts of solidification structures and macrosegregations in heavy steel ingots**

I. Poitraul, A. Gingell - Industeel  
ArcelorMittal, Le Creusot, France  
M. Zaloznik, H. Combeau, N. Leriche  
- Nancy-Université, Ecole des Mines de  
Nancy, France  
C. David - Sciences Computers  
Consultants, Saint Etienne, France

**16.50 Minimisation of ingot cast product defects through improved mould geometry**

P. Patil, R. Nalawade - Bharat Forge Ltd.,  
Pune, India  
G. Balachandran, V. Balasubramanian  
- Kalyani Carpenter Special Steels Ltd.,  
Pune, India

**17.10 Integrated temperature and degassing modeling for ingot casting meltshop**

S. Lachmann - Schmiedewerke Gröditz,  
Germany  
B. Kleimt, M. Schlautmann -  
Betriebsforschungsinstitut Düsseldorf,  
Germany

**17.30 Multiphase modeling of macrosegregation with non-orthogonal grids**

W. Tu, H. Shen, B. Liu - Tsinghua  
University, Beijing, China

**19.00-22.30  
SOCIAL EVENT**

Cocktail and visit to the  
"Last supper" by Leonardo  
Symphony Concert at Basilica  
of Sant'Ambrogio

Friday 9 May 2014

## Room VOLTA

**INGOT CASTING  
Remelting & Technology**CHAIRPERSON: **Led Medovar** - *Elmet-Roll, Ukraine*

- 8.50 Lifetime-extension of ingot casting molds**  
D. Brach - *University of Duisburg-Essen, Germany*  
O. Koeser - *Calcom ESI, Switzerland*
- 9.10 Characteristic of the new VIM X-eed® Unit from SMS Mevac**  
C. Demirci, M. Hüllen, M. Thiehofe, M. Neumann - *SMS Mevac, Essen, Germany*
- 9.30 Secondary metallurgy for vacuum tank degasser and vacuum ingots casting**  
C. Schrade - *Tenova Technometal, Duisburg, Germany*  
K. Shoop - *Tenova CORE, Coraopolis PA, USA*
- 9.50 Latest vertical casting solutions**  
F. Wimmer - *Siemens VAI Metals Technologies GmbH, Linz, Austria*
- 10.10 Production experience of ingots from 80 to 120 ton at Breitenfeld Edelstahl**  
F. Schneller, W. Spreitzhofer, R. Schlager, G. Kortan - *Breitenfeld Edelstahl AG, Mitterdorf Im Mürtztal, Austria*
- 10.30 Production of heavy forging ingots up to 250 tons via the ESR process - Operational experiences and process optimization methods**  
M. Kubin - *Inteco Special Melting Technologies GmbH, Bruck An Der Mur, Austria*
- 10.50** Coffee break

**INGOT CASTING  
Quality & Metallurgy**CHAIRPERSON: **Pál Tardy** - *MVAE Hungarian Steel Association, Hungary*

- 11.20 Innovative technique and process control for production of stainless steel ingots with low carbon contents**  
M. Schlautmann, B. Kleimt - *VDEh-Betriebsforschungsinstitut, Düsseldorf, Germany*  
M. Kühnemund, F. Stahl - *Dörrenberg Edelstahl GmbH, Germany*
- 11.40 Investigation of cleanliness and inclusion distribution in quasi-industrial large ingots**  
Z. Chen, S. Fronk, D. Senk - *RWTH Aachen University, Germany*
- 12.00 Management of superduplex's process parameters through numerical models and experimental tests**  
M. Marten-Perolino - *Cogne Acciai Speciali, Italy*
- 12.20 Carbon transportation in the tundish during multi-concentration pouring process for large steel ingots**  
J. Kang, C. Dong, H. Shen, B. Liu - *Tsinghua University, Beijing, China*
- 12.40** End of the Conference

**NOTE ON THE PROGRAMME**

*This programme is a preliminary programme. It is not definitive and it may be slightly modified: title and authors, cancelled or added papers, chairperson, timetable or duration, etc. Possible changes in the programme will be communicated before the beginning of the Conference.*

## GENERAL INFORMATION

### Conference Venue

The Conference will be held in Milan, at Palazzo delle Stelline - Corso Magenta, 61 (<http://www.stelline.it>). Palazzo delle Stelline, an ancient 15th century structure, is an oasis of peace and tranquility, right in the heart of Milan. Close to some of the most important monumental areas of the city it will allow to easily reach the areas involved in the activities that made Milan the economic capital of the country.

### Accommodation

Updated information on accommodation is available on the Conference website: [www.aimnet.it/icrf2014.htm](http://www.aimnet.it/icrf2014.htm)

### Language

The official language of the Conference will be English.

### Proceedings

The full text of the accepted papers will be published in the CD-Rom proceedings and issued to attendees on arrival at the Conference.

## REGISTRATION INFORMATION

Registration fees <i>revenue stamp included</i>		
Standard fees (NON members)		
Regular participant:	850 €	(900 € after 11 April)
Speaker/Session chairperson:	690 €	
Student:(*)	390 €	
AIM member fees		
Regular participant:	730 €	(780 € after 11 April)
Speaker/Session chairperson:	570 €	
AIM junior members:	free	
Accompanying person: (includes only the social event – May 8, 2014)	100 €	plus VAT 22%

*Conference Registration fees include admittance to technical sessions, Conference bag with CD-Rom proceedings, coffee breaks, lunches and the social event organized in the evening of Thursday 8 May. For non-members the fee includes AIM Membership for the last three quarters of 2014 and for the year 2015.*

*(\*) Students will have to provide valid proof of student status. Student registration fee includes access to technical sessions, Conference bag with CD-Rom proceedings, coffee breaks and lunches.*

*The social event (8 May) is **not** included in the student registration fee.*

### Payment and remittance

- by credit card online ([www.aimnet.it/icrf2014.htm](http://www.aimnet.it/icrf2014.htm));
- by bank transfer, to the order of Associazione Italiana di Metallurgia - AIM at "Banca Popolare Commercio e Industria" (UBI Banca), Branch no. 2 - Via Borgogna 2/4 - 20122 Milano/Italy, account no. 000000022325 – cod. ABI 05048 - CAB 01602 - cin L, IBAN: IT92L050480160200000022325, swift code BLOPIT22. The transfer order must specify the name of the attendee and the reference "ICRF 2014". A copy of the transfer order must be sent to AIM, together with the Registration Form.

### Speakers registration

Please be aware that only papers submitted on time and with speaker regularly registered **before February 28, 2014** will be included in the final programme and published in the Conference proceedings. Registration forms will not be processed without payment.

A maximum of two papers will be considered for each speaker registered in time.

**Co-authors**, who wish to attend the Conference, will have to pay full registration fee.

### Advanced registration

If you plan to attend, please register online at: [www.aimnet.it/icrf2014.htm](http://www.aimnet.it/icrf2014.htm) or fill-in the enclosed Registration Form and send it to the Conference Secretariat at your earliest convenience, but **not later than April 11, 2014**.

Please use a separate form for each participant.

For further information, please contact the Conference Secretariat by e-mail, if possible.

### Cancellation and refund policy

A refund, **less 20%** deduction for administrative costs, will be issued for written cancellations received **by April 22, 2014**. For attendees who notify their cancellation **after April 22, 2014** or will not attend the conference, **a charge of 100% of the conference fee** will be withheld and a copy of the proceedings will be sent after the event.

### Insurance

The Conference Secretariat cannot assume any responsibility for personal accident, loss or damage to the private property of participants and accompanying persons, which may either occur during or arise from the conference. Participants should therefore take whatever steps they consider necessary as regards insurance.

### Visa Application Form

If you need an official invitation please send your request to the Conference Secretariat before **April 7, 2014** complete with family and first name, birth date, passport number, arrival and departure dates, nationality and Italian Embassy fax number.

It's important that you ask directly to the Embassy which documents are necessary to apply for visa.

### ICRF 2014 for Exhibitors and Sponsors

As an integral element of the event, the Conference will feature an exhibition, consisting of Table Top units that will enable excellent exposure for products, technologies, innovative solutions or services. At this opportunity the Organizers will set an area strategically located as regards the main Conference rooms.

Companies will be able to reinforce their participation and enhance their corporate identification by taking advantage of benefits offered to them as Contributing Sponsors of the Conference. The detailed sponsorship packages are available on the Conference website: [www.aimnet.it/icrf2014.htm](http://www.aimnet.it/icrf2014.htm).

For further information please refer to the Conference Secretariat ([aim@aimnet.it](mailto:aim@aimnet.it)).

### SOCIAL PROGRAMME

AIM is pleased to offer the following social programme in the evening of Thursday 8 May 2014.

19.00-21.00 **Cocktail** on the terrace by the **Leonardo's botanic garden**.

During the cocktail, the first 200 registered participants will be accompanied in groups of 25 people to **visit the "Last supper" by Leonardo**. Each visit will last 15 minutes, according to the strict regulation imposed by the Ministry of Culture.

21.15-22.30 **Symphony concert at the Basilica of Sant'Ambrogio** – Johannes Brahms – symphony nr, 1 op. 68 in do minore.

## Milan

Milan is the powerhouse of Italy: it produces 10% of the country's GNP; 25% of domestic research, it is home to 10 universities and every year it attracts over 4 million tourists.

The Romans called it "Mediolanum" due to its position at the centre of the main communication routes of the time. Today, it is still one of Europe's most accessible and welcoming cities: 200 destinations linked by 364,000 flights a year, 380 hotels with over 21,000 guest rooms.

An immense system that comprises not only manufacturing, but also services, culture, entertainment, art, cinema, television, NGOs, fashion, sport and research.

Milan has ancient origins; it was the capital of the Western Roman Empire and boasts a unique, world-famous artistic heritage, of which the best known is Leonardo da Vinci's Last Supper. Today the international centre of fashion and design, and a shopper's paradise, Milan is a vibrant, trendy city, brimming with things to do and with a constantly changing scenario of clubs, bars and restaurants. All this against a truly enviable backdrop, Lombardy: dotted with charming cities of art, it is the region with the greatest expanse of natural parks and magnificent lakes - such as Lake Como - surrounded by mountains that attract numerous hikers and skiers. Without forgetting the rich flavours of Lombardy's internationally renowned foods and wines. All this just over two hours from Venice, Florence and Genoa.

## Travel information

### How to reach Palazzo delle Stelline

#### by PLANE

Milano has two main international airports: Linate airport and Malpensa airport and an additional one, Orio al Serio, mainly popular for low cost airlines.

For information about Malpensa, Linate and Orio shuttles: [www.malpensashuttle.it](http://www.malpensashuttle.it)

**From the Airport of Linate:** take bus 73 departing from the piazza of the airport and exit at the end of the line, in piazza San Babila; take the Metropolitana MM1 in the direction of Fiera/Rho, exit to the stop for Cadorna Triennale, turn into piazza Cadorna, turn into via Carducci and continue to the first traffic light, crossing corso Magenta, Hotel Palazzo delle Stelline awaits you at number 61.

**From the Airport of Malpensa:** take shuttle train "Malpensa Express" and reach the head of the line at Milano Cadorna, turn into piazza Cadorna, turn into via Carducci and continue to the first traffic light, crossing corso Magenta, Hotel Palazzo delle Stelline awaits you at number 61.

#### by TRAIN

Arriving at the Central Station of Milan, or at the station Porta Garibaldi, take the Metropolitana (underground) MM2 in the direction of Abbiategrasso and exit to the stop for Cadorna Triennale, turn into piazza Cadorna, turn into via Carducci and continue to the first traffic light, crossing corso Magenta, Palazzo delle Stelline awaits you at number 61.

Milano Centrale Railway Station: Piazza Duca d'Aosta, 1 - 20124 Milano.

For information: [www.trenitalia.com](http://www.trenitalia.com)

#### by CAR

**From the northern highway** (A4 Torino/Venezia; A9 Como/Chiasso; A8 Varese), after the tollbooth, continue in the direction of Milan and take the exit Milano Certosa, go to the end of viale Certosa, cross two crossings and merge into corso Sempione, at the end of the corso turn right on via Canova, at the end of the via turn right in via Pagano, after 200 m turn left in via Monti until reaching the crossing with corso Magenta, turn right and reach number 61, where you are welcomed to Palazzo delle Stelline.

**From highway A1** (Bologna), after the tollbooth, turn into the exit of piazzale Corvetto, turn right and you will arrive at piazzale Bologna, turn left through via Bacchiglione continue 100 m and turn right on corso Lodi. After 700 m, reaching porta Romana, turn left on via Filippetti (inner beltway), continue along viale Beatrice d'Este, viale Gian Galeazzo, viale d'Annunzio, viale Papiniano, viale of Porta Vercellina, arriving at piazzale Baracca, turn right, where at number 61 you are welcomed to Palazzo delle Stelline.

**From highway A7** (Genova): after the tollbooth, turn into the western tangential in the direction of Venice, exit at Milano Certosa and continue as indicated above.

# REGISTRATION FORM

Please complete and return this form by April 11, 2014



2<sup>nd</sup> International Conference

Milan · Italy, 7-9 May 2014

To register please fill-in the following registration form in all its parts.  
(It is also possible to register online – [www.aimnet.it/icrf2014.htm](http://www.aimnet.it/icrf2014.htm))

**Please use BLOCK letters throughout form** (photocopies can be used)

## PERSONAL AND INVOICING DATA

Family Name .....

First Name(s) .....

Company Name .....

Company Fiscal Address .....

ZipCode ..... Town .....

Country .....

e-mail for correspondence .....

e-mail for invoicing and billing information .....

Tel. .... Fax .....

VAT and FISCAL CODE (if different) .....

Order ref. number (if requested on the invoice) .....

I will attend the Conference as:  NON MEMBER  AIM MEMBER

Delegate € .....

Speaker (paper/s number ..... ) € .....

Chairperson of the Session € .....

Student € .....

AIM Junior Member free

n. .... Accompanying Persons/Social event € .....

**Total amount being paid:** € .....

by credit card online ([www.aimnet.it/ICRF2014.htm](http://www.aimnet.it/ICRF2014.htm))

by bank transfer, to the order of Associazione Italiana di Metallurgia - AIM at "Banca Popolare Commercio e Industria" (UBI Banca), Branch no. 2 - Via Borgogna 2/4 - Milano, account no. 000000022325 – cod. ABI 05048 - CAB 01602 - cin L, IBAN: IT92L0504801602000000022325, swift code BLOPIT22. The transfer order must specify the name of the delegate and the reference "ICRF 2014". A copy of the transfer order must be sent to AIM, together with this Registration Form

We inform you that data collected will be treated following the normal institutional activity of AIM. In accordance to article 130 of the DLgs 196/03 in every moment the interested party has the right to oppose the treatment of one's personal data. Your data will be dealt with in accordance of the DLgs. in 30th June 2003 n.196, guaranteeing the rights of the interested parties foreseen in the 7 art. of the Decree. We also inform you that AIM will communicate to foreign partners the personal data only for above reasons. We also inform you that your personal data will be on the list of the conference participants. In the case that you **DO NOT** want to appear on this list you may block the mail box. We also inform you that the holder of the personal data is AIM in Milan in Ple Morandi 2, while owner of the personal data is ing. Ottavio Lecis, available near the AIM offices.

Date.....

Signature.....

**ICRF 2014 - Conference Secretariat** - [aim@aimnet.it](mailto:aim@aimnet.it) - fax +39 027602 0551

# TIME TABLE

## Wednesday, 7 May 2014

8.00	Registration	
	<b>Room VOLTA</b>	
	<b>OPENING SESSION</b>	
9.00	<b>Welcome addresses</b>	
9.40	<b>Opening Lectures</b>	
11.10	<i>coffee break &amp; Opening of the Exhibition</i>	
11.40	<b>Rolling &amp; Forging: Open Die Forging</b>	
12.40	<i>lunch</i>	
	<b>Room VOLTA</b>	<b>Room VERDI</b>
14.10	<b>Rolling &amp; Forging: Simulation 1</b>	<b>STEEL MARKET OUTLOOK</b>
15.50	<i>coffee break</i>	
16.20	<b>Ingot Casting: Simulation 1</b>	<b>STEEL MARKET OUTLOOK</b>
18.00	<i>End of the first day</i>	

## Thursday, 8 May 2014

	<b>Room VOLTA</b>	<b>Room VERDI</b>
9.00	<b>Ingot Casting: Remelting 1</b>	<b>Innovative materials &amp; applications</b>
10.40	<i>coffee break</i>	
11.10	<b>Rolling &amp; Forging: Technology</b>	<b>Rolling &amp; Forging: Measurement &amp; Testing</b>
12.50	<i>lunch</i>	
14.20	<b>Ingot Casting: Additives &amp; Refractories Development</b>	<b>Rolling &amp; Forging: Simulation 2</b>
16.00	<i>coffee break</i>	
16.30	<b>Ingot Casting: Remelting 2</b>	<b>Ingot Casting: Simulation 2</b>
	<b>SOCIAL EVENT</b>	

## Friday, 9 May 2014

	<b>Room VOLTA</b>	
8.50	<b>Ingot Casting: Remelting &amp; Technology</b>	
10.50	<i>coffee break</i>	
11.20	<b>Ingot Casting: Quality &amp; Metallurgy</b>	
12.40	<i>End of the Conference</i>	

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## ORGANISING SECRETARIAT



**ASSOCIAZIONE ITALIANA DI METALLURGIA (AIM)**

Piazzale Rodolfo Morandi 2 - I - 20121 MILANO - ITALY

Telefono +39 02.76021132 - Fax +39 02.76020551

e-mail: [aim@aimnet.it](mailto:aim@aimnet.it)