



4th European Conference on

TURBOMACHINERY

FLUID DYNAMICS AND THERMODYNAMICS

20-23 March, 2001

FIRENZE, Italy

Final Program

European Commission

Ansaldo Energia

FiatAvio

ENEL - Produzione

DLR

Deutsches Zentrum für Luft- und Raumfahrt

EOARD

*European Office of Aerospace Research and Development,
United States Air Force & Naval Research, Europe*

Nuovo Pignone - GE

Provincia di Firenze

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ATI

Associazione Termotecnica Italiana


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corresponding amount.

All participants will benefit of a
special discount on available fares.

Euroturbo 4

4th European Conference on TURBOMACHINERY Fluid Dynamics and Thermodynamics

March 20-23, 2001

FIRENZE – ITALY

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Associated Organisations

Associazione Termotecnica Italiana (I)

Belgian Society of Mechanical and Environmental Engineering (B)

Koninklijke Vlaamse Ingenieursvereniging (B)

Institution of Mechanical Engineers (UK)

Institution of Engineers in Ireland (IRL)

Société Francaise des Mécaniciens (F)

VDI-Gesellschaft Energietechnik (D)

Komitet Problemow Energetyki P.A.N. (PL)

Association of Czech Mechanical Engineers (CZ)

Svenska Mekanisters Riskforbund (S)

Royal Institution of Engineers in the Netherlands (KIVI) (NL)

General Information

The 4th European Conference on Turbomachinery Fluid Dynamics and Thermodynamics, **EUROTURBO4**, is being organised in March 2001, beginning on Tuesday, March 20 and concluding on Friday, March 23. The 4-day technical program is supplemented with a series of Social functions over the week fostering international friendships, discussions, and collaborative ventures.

The Conference city is the world famous Florence, culturally and historically one of the richest in the World. Florence, located in the centre of Italy, 300 km north of Rome and south of Milan, is a city of 500,000 inhabitants, is situated on the river Arno, cradled by rolling hills covered with villas and farms, vineyards and orchards. Originally a Roman settlement, then Medieval County, Florence went on to be a Medici Signoria, a Republic, a grand duchy and lastly, the first capital of the Kingdom of Italy. A visit to Florence can be an amazing experience, with the beauty of the churches and monuments (Baptistery, Cathedral of S. Maria Del Fiore, Giotto Tower, Palazzo Vecchio etc.) and its world wide famous museums (Uffizi Gallery, Bargello, Academia Gallery etc.).

Other important towns like Siena and Pisa are close to Florence and the Chianti hills, where the famous Italian red wine is produced, are just south of the city.

Conference Venue

The Conference will be held at the "Scuola di Sanità Militare", located in the heart of the city, Via Venezia, 5 (nearby P.zza S.Marco, see the map on the inside cover). The venue is not far from the Santa Maria Novella train station, and 5 kilometres from the Peretola Airport and the highway entrance.

Travel to Florence

By plane

Florence Airport Amerigo Vespucci located in Peretola is only 5 km from the city. The closest airport with more international connections is Pisa airport in Pisa, and there is a very good direct train service connecting this airport with Florence Central Station in only 50 minutes.

By train

Florence Central Railway Station is fifteen minutes walking from the Scuola di Sanità Militare where the Conference takes place. Florence is well connected to the European railway systems and Eurostar trains links to Milan and Rome in only 2 to 3 hours.

By road

Several motorways pass close to Florence, that provide access to the important cities of Italy, and then in Europe.

Travel Agency and Hotel Accommodation

INTERTRAVEL Co srl
via Lamberti 39/41r, 50123 FIRENZE – ITALY
Phone: +39 055 21 79 36/7/8
Fax: +39 055 29 33 07
E-mail: itcongre@tin.it

The Lunch

People can pick up information on the restaurant location surrounding the Conference Venue at the registration desk.

Registration

To register, tick properly the registration form enclosed in the present program and send it to:

Euroturbo4 c/o Energetics Department "Sergio Stecco"
Via S.Marta, 3 - 50139 Firenze, Italy
or fax it to:
+39 055 47 96 342

Please note that your registration can only be accepted if you have paid by one of the methods indicated in the registration form, or if you have supplied a valid order number so that an invoice can be prepared.

Preregistrants may pick up the Conference material at the registration desk. **Pre registration will be accepted up to February 2, 2001.**

On-site Registration

A Registration Form to be used for On-site Registration will be available at the desk.

Registration Fees are pointed in the registration form included in this program.

The Full, Student and East Country registration fees include a copy of Conference Proceedings, access to Conference sessions and to Tuesday's Welcome Reception buffet. **The fee does not include the Conference Gala dinner on Wednesday evening;** reservations for this event will be done at the onsite registration desk. Day visitor fee allows to attend the Conference session of the selected day. Accompanying person fee includes only the access to Tuesday's Welcome Reception buffet.

Students are kindly asked to provide a certification of their student status together with the registration form.

Conference Registration and Information Desk

The Registration Desk will be open from 8:00 AM in through early afternoon from Tuesday, March 20 at the Conference venue.

Cancellations

Delegates who cancel their registration by February 2, 2001 will have their fees refunded less an administration charge of ITL 50,000 (25 Euro). **No refund will be made after this date.** Replacement delegates will be accepted.

Conference Proceedings

The Conference Proceedings, will be available onsite for pre-registrant attendee. Further copies, if not available on site, will be mailed; mailing charge ITL 30,000 (15 Euro);

Purchase of Additional Copies of Proceedings

Additional copies of Proceedings may be ordered up to March 10th, 2001 (see registration form included in this program)

Payment

All Payment onsite are required in Italian Lira or in EURO. Major Credit Cards are welcomed for payment.

Enquiries

Enquiries can be addressed to:

Ing. Simone Pazzi
Energetics Department "Sergio Stecco"
Via S.Marta, 3 - 50139 Firenze, Italy

Phone: +39 055 47 96 239
Fax: +39 055 47 96 342
E-mail: euroturbo4@ing.unifi.it

Updated information will be available at the following web address

<http://www.ing.unifi.it/teeg/tmachinery>

Technical Tours

Two technical Tours will take place on **Friday, March 23**. Application forms will be available at the Registration Desk, early onsite registration is warmly suggested as the number of seats available is limited. It is possible to choose between two options:

Tour 1 **Nuovo Pignone – G.E. Factory**
Departure 15.30
Start 16.00
End 18.00
Description The tour will offer the chance to visit the factory where Gas Turbines, Axial and Centrifugal Compressors are developed built and tested by Nuovo Pignone – G.E.

Tour 2 **ENEL - Gas Turbine combustor test rig**
Departure 14.30
Start 16.30
End 18.30
Arrival back 20.30
in Florence
Description The Tour will lead people to visit the facility settled up by ENEL. To test Gas Turbine Combustor in full scale and at working conditions.

These are suggested schedules; variations will be possible on Departure times. Ask for confirmation at the Conference Desk.

The Conference

Transportation

Most of the Hotels are near the Scuola di Sanità Militare, generally only 10 minutes walking; all the Hotels far away are well served by Public Transports (ATAF), being maximum 15 minutes far from the Conference.

Exhibition

Some spaces (Booth) are available around session rooms where leading Companies and Research Agencies will report on their products and activity. Brochures and other material from Journal Publishers will be available at Registration Desk as well.

Speaker's Briefing

Authors who are presenting papers and session chairs will meet for a short briefing five minutes before the starting of their session in the session room. Please attend on the day of your session only.

Timing of Presentation

Each paper will be allotted 30 minutes (including introduction and question-and-answer period) except where noted. Concurrent sessions will maintain uniform start times.

Audio-visual

Each session room will be pre-set with the following: one overhead projector, one screen, a microphone and a 35mm slide projector. A VHS VCR, a computer projection system and a monitor will be set only if requested to the organisation before Friday, March 9; special audio-visual equipment requested after this date may not be available.

Messages and Information

Messages will be recorded and posted on a bulletin board in the registration area. Telephone number for message recording will be indicated within the Conference Web Page as soon as it will be available. Messages could also be faxed to:

+39 055 4796 342 (specifying 4 ETC in the subject)
or via e-mail (euroturbo4@ing.unifi.it)

Smoking Policy

Out of courtesy to others, smoking is not allowed in Conference rooms.

Restrictions

Videotaping or audio recording of any session during this conference is prohibited. The sale of any publication not authorised by Euroturbo4 is also prohibited.

Social Events

Welcome Reception Buffet

Attendees and guests are invited to start the **Euroturbo4** Conference on Tuesday evening with a Welcome Reception buffet which will give you a chance to renew acquaintances, meet new friends, and get an introduction to Florentine hospitality. The buffet will be held from 7:30 pm.

Conference Gala Dinner

Wednesday night will offer you the opportunity to enjoy the Conference Gala Dinner hosted in a typical "Middle age Villa" in the surroundings of Florence.

Excursions and Tours

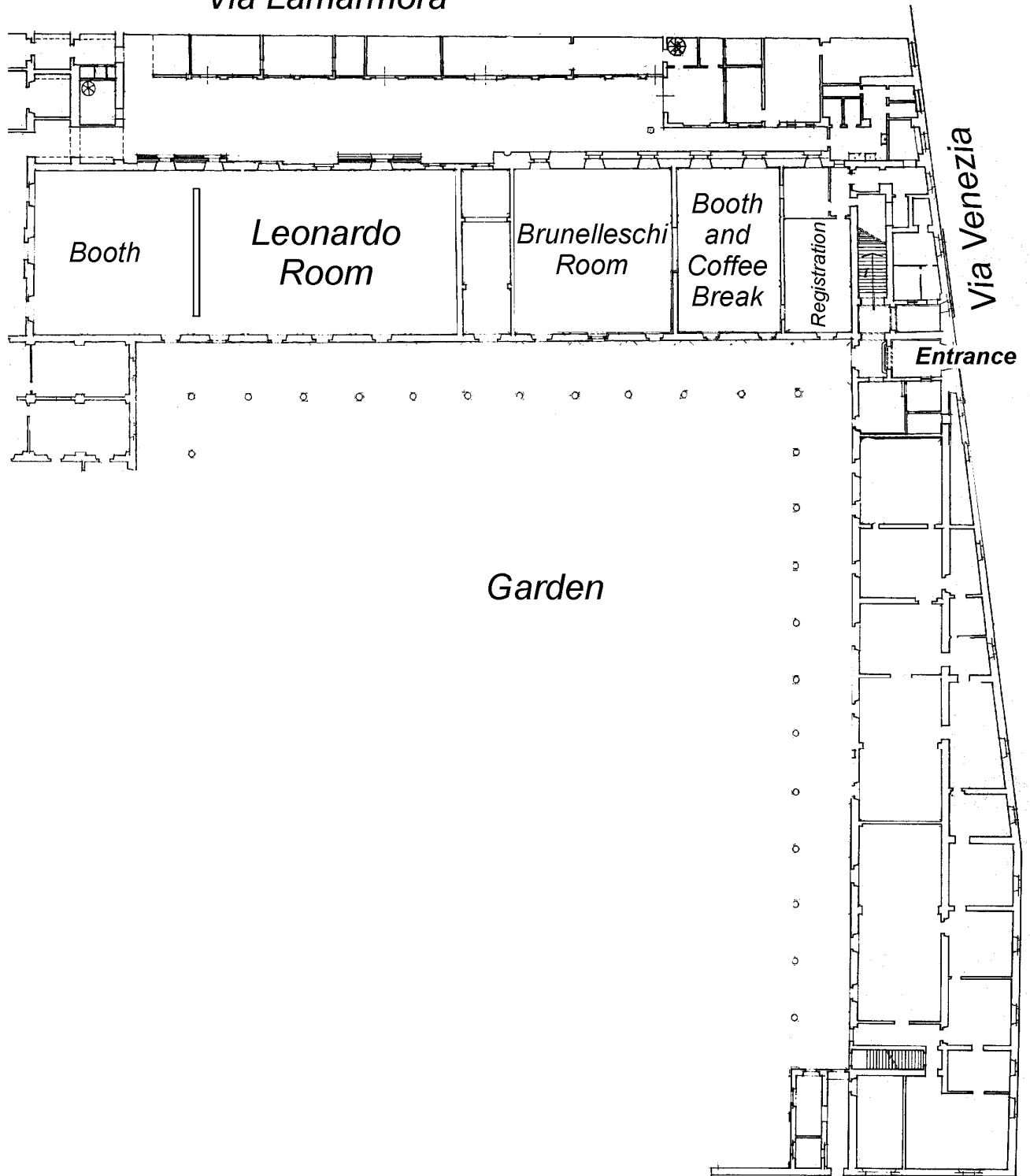
Florence attractions are well known, and any information about the tourist activity can be asked at the registration desk where Accompanying Persons Program Reservation Forms will be available as well. Proposed visits are as follows:

Tour A Half Day Tour Florence with Uffizi Gallery
Type Bus/Walking Tour
Program Guided tour (*in English*) of Florence, through Piazza Santa Maria Novella, with its church, San Lorenzo Church and its market; the Cathedral with its Baptistery and the Paradise Gate. Through Via Calzaiuoli, arrival to Piazza Signoria and visit of the Palazzo Vecchio from outside. Booked entrance to the Uffizi Gallery and visit of the most important paintings of the museum.
Groups Minimum number of participants 30
 ITL 60,000 per person
Days Wednesday, March 21

Tour B Full Day Siena and San Gimignano
Type Bus Tour
Program An interesting excursion through the country-side of the Chianti area among delightful hills, with an ever-changing scenery. A guided visit to San Gimignano, an enchanting tiny town that has remained intact through the centuries. The town, situated on the top of a hill, is famous for its numerous towers, frescos and other art treasures. On arrival in Siena, lunch will be served in a typical restaurant (3 courses, included drinks). Then visit to the magnificent Cathedral, Piazza Del Campo, the Town Hall, through the celebrated "Contrade"; then departure from Siena to be back in Florence before dinner.
Groups Minimum participants 30
 ITL 140,000 per person
Day Thursday, March 22

These are suggested schedules; variations will be possible on Departure times and programs. Ask for confirmation at the Conference Desk.

Via Lamarmora



Entrance

Via Venezia

Garden

*Scuola di Sanità Militare
Map of the Conference Venue*

PROGRAM AT A GLANCE

Tuesday, March 20

				<i>Room</i>
AM	8:00-9:00	Registration		
	9:00-9:10	Opening Ceremony		Leonardo
	9:10-10:00	IL-01	Invited Lecturer - <i>Dave Hope (UK)</i>	Leonardo
	10:00-12:30	Session A-01	Axial Turbine Aerodynamics - I	Leonardo
		Session B-01	Pumps - I	Brunelleschi

PM	14:00-18:00	Session A-02	Steam Turbines - I	Leonardo
		Session B-02	Axial Compressor Aerodynamics - I	Brunelleschi
		Session A-03	Steam Turbines - II	Leonardo
		Session B-03	Secondary Flows - I	Brunelleschi

19:30	Euroturbo4 Welcome Reception Buffet
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Wednesday, March 21

AM	8:30-9:30	IL-02	Invited Lecturer - <i>René Van den Braembussche (B)</i>	
	9:30-12:30	Session A-04	Heat Transfer	Leonardo
Session B-04		Centrifugal Compressors	Brunelleschi	

PM	14:00-18:00	Session A-05	Unsteady Flows - I	Leonardo
		Session B-05	Secondary Flows - II	Brunelleschi
		Session A-06	Axial Turbine Aerodynamics - II	Leonardo
		Session B-06	Pumps - II	Brunelleschi

20:00	Conference Gala Dinner
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Thursday, March 22

AM	8:30-12:30	Session A-07	Unsteady Flows and Aeroelasticity	Leonardo
		Session B-07	Optimal Design	Brunelleschi
		Session A-08	Steam Turbines - III	Leonardo
		Session B-08	Turbomachinery Design and Analysis	Brunelleschi

PM	14:00-18:00	Session A-09	Unsteady Flows - II	Leonardo
		Session B-09	Noise	Brunelleschi
		Session A-10	Axial Turbine Aerodynamics - III	Leonardo
		Session B-10	Special Configurations	Brunelleschi

Friday, March 23

AM	8:30-13:30	Session A-11	Axial Turbine Aerodynamics - IV	Leonardo
		Session B-11	Axial Compressor Aerodynamics - II	Brunelleschi
		Session A-12	Transition and Turbulence Modelling	Leonardo
		Session B-12	Performance Testing and Monitoring	Brunelleschi

PM	Technical Tour 1: Nuovo Pignone – G.E. Technical Tour 2: ENEL - G.T. Combustor test rig
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Tuesday, March 20, 2001

Morning

8:00-9:00	Registration	
9:00-9:10	Opening Ceremony	
9:10	Invited Lecturer: The Application of CFD to Fan Design for Aero Engines IL-01 Dave Hope, <i>Chief of Fan Aerodynamic Technology, Rolls-Royce plc., UK</i>	
A-01 - Axial Turbine Aerodynamics - I	Leonardo room	Brunelleschi room
<i>Chairman: W. Riess (D)</i>		<i>Chairman: R. Schilling (D)</i>
<i>ATI-CST-009/01</i> Improved Blade Profiles for High Lift Low Pressure Turbine Applications <i>Paloma González, Industria de turbopropulsores -ITP, S.Fernando de Henares, Spain; Howard Hodson, Whittle Lab, Cambridge, Uk; I. Ulizar, ITP SA., Madrid, Spain</i>	10:00	<i>ATI-CST-046/01</i> Rotor-Stator Interaction in a Centrifugal Pump Equipped with a Vaned Diffuser <i>Mohamoud El Hejem, Abdul Akhras, Robert Morel, J. Champagne, Laboratoire de Mécanique des fluides INSA, Villeurbanne Lyon, France;</i>
<i>ATI-CST-010/01</i> Effects of Reynolds and Mach Number on the Profile Losses of a Conventional Low Pressure Turbine Rotor Cascade with Increasing Pitch to Chord Ratio <i>Thomas Coton, Tony Arts, Von Karman Institute for Fluid Dynamics, Turbomachinery Department, Rhode Saint Genese, Belgium; Michael Lefebvre, SNECMA – Moteurs Moissy-Cremayel, France</i>	10:30	<i>ATI-CST-047/01</i> Analysis of Flow Velocities Within the Impeller and the Vaneless Diffuser of a Radial Flow Pump <i>G. Wuibaut, G. Bois, Guy Caignert, Laboratoire de Mecanique de Lille ENSAM, Lille Cedex, France; P. Dupont, M. Stanislas, Ecole centrale de Lille Cité Scientifique, Villeneuve d'Ascq Cedex, France</i>
11:00 - Coffee Break		
<i>ATI-CST-008/01</i> Evaluation of Two Competitive Approaches for Simulating the Time-Periodic Flow in an Axial Turbine Stage <i>Gilles Billonnet, Antoine Fourmaux, Clément Toussaint, ONERA Applied Aerodynamics Department, Chatillon-Cedex, France</i>	11:30	<i>ATI-CST-048/01</i> The Flow Field of Pump Impellers with Forward and Backward Swept Blades <i>Martin Forstner, K. Kuhn, Wolfgang Glas, Helmut Jaberg, Inst. F. Hydraulic Fluid Machinery, TU Graz, Graz, Austria</i>
<i>ATI-CST-011/01</i> On the Choice of Variables and Matching Criteria for the Steady Simulation of Transonic Axial Turbine Stages <i>Vittorio Michelassi, Department of Mechanical and Industrial Engineering, Rome, Italy; Paolo Giangiacomo, Francesco Martelli, Dipartimento di Energetica "Sergio Stecco", Università di Firenze, Firenze, Italy</i>	12:00	<i>ATI-CST-049/01</i> Numerical Calculation of Swirling Diffuser Flow <i>P. Abrahamsen, Hamworthy KSE, Lier, Norway</i>
12:30 - Lunch		

Tuesday, March 20, 2001

Afternoon

A-02 - Steam Turbines - I Leonardo room Chairman: L. Mareto (I)		Brunelleschi room B-02 - Axial Compressor Aerodynamics - I Chairman: G. Bois (F)
ATI-CST-064/01 Exhaust Hoods of Double Flow Arrangement Ladislav Tajc, Lukas Bednar, SKODA ENERGO s.r.o., Plzen, Czech Republic; Jiri Polansky, ZCU v Plzni, Plzen, Czech Republic; Eduard Gudkov, NPO CKTI StPetersburg, St. Petersburg, Russia	14:00	ATI-CST-001/01 Stall Inception in a 5-Stage HP-Compressor Under the Influence of Rotating Inlet Distortion Thomas Peters, Thomas Buergener, Leonhard Fottner, Institut fur Strahlantriebe, Universitat der Bundeswehr Munchen, Neubiberg, Germany
ATI-CST-065/01 Flow in Nozzle Part of a Transonic Turbine Stage with Long Blades Parel Safarik, Miroslav Stastny, Jaroslav Synac, Czech Technical University in Prague, Faculty of Mechanical Engineering, Prague 6-Dejvice, Czech Republic; Juergen Mayer, Alexander Jung, Heinz Stetter, Institute for Thermal Turbomachinery and Machinery Laboratory, Stuttgart, Germany	14:30	ATI-CST-002/01 The Analysis of Unsteady Flow Field and the Decay Characteristics of the Rotor Blade Wake in the Axial Flow Low Speed Compressor Stage Andrzej Witkowski, Tadeusz Chmielniak, Michal Strozik, Silesian Technical University, Institute Of Power Machinery, Gliwice, Poland
ATI-CST-066/01 Design Optimisation of Annular Diffuser in Consideration of Efficiency and Unsteady Flow Peter Kraus, Joachim Messner, ITSM, University of Stuttgart, Stuttgart, Germany; Heinz Stetter, Institute for Thermal Turbomachinery and Machinery Laboratory, Stuttgart, Germany	15:00	ATI-CST-003/01 Influence of Variable Inlet Guide Vanes on the Operational Behaviour of Multistage Axial Compressors with Various Aerodynamic Load Distributions Reinhard Willinger, Klaus Horzer, Hermann Haselbacher, Institute of Thermal Turbomachines and Powerplants, Vienna University of Technology, Wien, Austria
15:30 - Coffee Break		
A-03 - Steam Turbines - II Leonardo room Chairman: G. Dibelius (D)		Brunelleschi room B-03 - Secondary Flows - I Chairman: P. Zunino (I)
ATI-CST-067/01 Heterogeneous Effects in the Droplet Nucleation Process in LP Steam Turbines Vaclav Petr, Michal Kolovratnik, Department of Fluid Dynamics and Power Eng., Czech Technical University, Prague, Czech Republic	16:00	ATI-CST-054/01 Computational Study of the Interaction of Labyrinth Seal Leakage Flow and Main Flow in an Axial Turbine J. Anker, ITSM, Juergen Mayer, Heinz Stetter, Institute for Thermal Turbomachinery and Machinery Laboratory, Stuttgart, Germany
ATI-CST-068/01 Nucleating Unsteady Flow in Low Pressure Steam Turbine Stages G. Winkler, G. Schnerr, University of Karlsruhe, Karlsruhe, Germany	16:30	ATI-CST-055/01 Non-Axis Symmetric Turbine End Wall Profiling D. Gregory-Smith, Grant Ingram, School of Engineering, University of Durham, Durham, UK; P. Jayaraman, Department of Chemical Engineering, University of Birmingham, Birmingham, UK; N. Harvey, M. Rose, Rolls-Royce Ltd., Turbomachinery Dept., PCF Main Office, Derby, UK
ATI-CST-069/01 Two Population Numerical Model of Heterohomogeneous Condensation of the Steam Flowing in Turbine Cascades Miroslav Stastny, Czech Technical University in Prague, Faculty of Mechanical Engineering, Prague 6-Dejvice, Czech Republic; Miroslav Sejna, PC-Progress s.r.o., Praha 2, Czech Republic	17:00	ATI-CST-057/01 Simulation of Secondary Flow Development Downstream of a Transonic Turbine Cascade using an implicit TVD Upwind Scheme Arno Gehrler, Institute for Thermal Turbomachinery and Machine Dynamics- Graz University of Technology, Graz, Austria
ATI-CST-070/01 Homogeneous and Heterogeneous Nucleation in a Nozzle Guide Vane of a LP-Steam Turbine Dieter Bohn, Huesnue Kerpici, Jing Ren, Norbert Suerken, Institute of Steam and Gas Turbines Aachen, Aachen, Germany	17:30	ATI-CST-056/01 Investigations of Gas Turbine Exhaust Diffuser Flows Hans Fleige, W. Riess, Institute of Turbomachinery-University of Hannover, Hannover, Germany
19:30 - Euroturbo4 Welcome Reception Buffet		

Wednesday, March 21, 2001**Morning**

8:30	Invited Lecturer: Design and Optimisation of Turbomachinery Components	
IL-02	René Van den Braembussche, <i>Von Karman Institute, Rhode Saint Genese, Belgium</i>	
A-04 - Heat Transfer <i>Chairman: T. Arts (B)</i>	Leonardo room	Brunelleschi room
		B-04 - Centrifugal Compressors <i>Chairman: U. Corradini (I)</i>
ATI-CST-028/01 Effects of Geometry on the Flow and Heat Transfer in a Rotating Cavity with a Stationary Outer Casing and Peripheral Flow Abdul Jaafar, <i>University of Putra Malaysia, Serdang, Selangor, Malaysia</i> ; Michael Wilson, J. Owen, <i>University of Bath, Bath, UK</i>	9:30	ATI-CST-023/01 Experimental and 3-D Numerical Analysis of the Flow Field in a Turbocharger Compressor Marc Gugau, B. Matyschok, B. Stoffel, <i>Tu Darmstadt, TFA, Darmstadt, Germany</i>
ATI-CST-029/01 On the Effects of Inclined Ribs on the Flow and Thermal Development in Straight Cooling Passages; An Experimental and Computational Study Hector Iacovides, G. Kelemenis, M. Raisee, <i>UMIST, Department of Mechanical Eng. Division of Thermodynamics & Fluid Mechanics, Manchester, UK</i>	10:00	ATI-CST-024/01 Off Design Flow Measurements within a High-Pressure Centrifugal Compressor Isabelle Trebeinjac, Christophe Vixege, <i>Ecole Centrale de Lyon, Ecully Cedex, France</i>
10:30 - Coffee Break		
ATI-CST-031/01 PIV Investigation of the Flow Characteristics in 2-leg Internal Coolant Passages of Gas Turbine Airfoils D. Chanteloup, <i>Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland</i> ; Albin Boelcs, <i>Swiss Federal Institute of Technology, Lausanne, Switzerland</i>	11:00	ATI-CST-025/01 Numerical and Experimental Investigation of a Centrifugal Compressor with an Inducer Casing Bleed System Renè Hunziker, Hans-Peter Dickmann, <i>ABB Turbo Systems Ltd., Baden, Switzerland</i> ; Roland Emmrich, <i>Institut für Strahltriebwerke und Turboarbeitsmaschinen der RWTH Aachen, Aachen, Germany</i>
ATI-CST-030/01 Basic Performance Characteristics of a Transpiration Cooling Method for Hot Gas Guiding Machine Elements using Evaporating Liquids Heinz Stetter, <i>Institute for Thermal Turbomachinery and Machinery Laboratory, Stuttgart, Germany</i> ; J. Wang, <i>ITSM, University of Stuttgart, Stuttgart, Germany</i>	11:30	ATI-CST-026/01 A Parametric Analysis of Inlet Volute for Centrifugal Compressors Stefano Echtner, Simone Pazzi, <i>Dipartimento di Energetica "Sergio Stecco", Università di Firenze, Firenze, Italy</i> ; Vittorio Michelassi, <i>Department of Mechanical and Industrial Engineering, Rome, Italy</i>
ATI-CST-032/01 Effect of Evaporation Cooling of Gas Turbine Blades on Design, Efficiency and Economy Sabine Ausmeier, Walter Bitterlich, Paul Winske, <i>University of Essen Energy and Power Technology, Essen, Germany</i>	12:00	ATI-CST-027/01 A Systematic Analysis of the Performance of Centrifugal Compressor Stages Daniele Fiaschi, G. Manfrida, A. Milani, <i>Energetics Department "S. Stecco" - University of Florence, Florence, Italy</i>
12:30 - Lunch		

Wednesday, March 21, 2001**Afternoon**

A-05 - Unsteady Flows - I Chairman: F. Martelli (I)	Leonardo room		Brunelleschi room	B-05 - Secondary Flows - II Chairman: D. Gregory Smith (UK)
ATI-CST-081/01 Time-Resolved Vane-Rotor-Vane Interaction in a Transonic One and a Half Stage Turbine R. Miller, R. Moss, Roger Ainsworth, <i>Department of Engineering Science, Oxford University, Oxford, UK</i> ; N. Harvey, <i>Rolls-Royce Ltd., Turbomachinery Dept., PCF Main Office, Derby, UK</i>		14:00	ATI-CST-060/01 On the Performance of Compressor Blades with Contoured Endwalls M. Hoeger, <i>Compressor Aerodynamics, TPMV, Munchen, Germany</i> ; N. Sievers, M. Lawerenz, <i>Institut fur Termische Energietechnik, Kassel, Germany</i>	
ATI-CST-082/01 The Effect of Rotor-Stator Interaction on Model Turbine Stage Performance Witold Elsner, Stanislaw Drobniak, Marian Wysocky, <i>T.U. of Czestochowa, Institute of Thermal Machinery, Czestochowa, Poland</i>		14:30	ATI-CST-059/01 Viscous Analysis of Turbine Blades with Three-Dimensional Design Carlo Cravero, <i>Università di Genova, Genova, Italy</i>	
ATI-CST-083/01 Wake-Rotor Interaction in Turbine Stages Michael Moczala, E. von Lavante, Oliver Schmid, <i>University of Essen, Essen, Germany</i>		15:00	ATI-CST-058/01 Aerodynamic Optimization of the Meridional Channel Contouring in Steam Turbine Stages Andrea Arnone, Francesco Bertini, <i>Dipartimento di Energetica "Sergio Stecco", Università di Firenze, Firenze, Italy</i> ; Stefano Cecchi, Luigi Maretto, <i>Ansaldo Energia Spa, Genova, Italy</i>	
15:30 - Coffee Break				
A-06 - Axial Turbine Aerodynamics - II Chairman: C. Scrivener (UK)	Leonardo room		Brunelleschi room	B-06 - Pumps - II Chairman: G. Kosyna (D)
ATI-CST-013/01 Experimental Examination of the Stator Flow in a 1.5-Stage Axial Turbine Test Stand Volker Breisig, André Giboni, Christian Lerner, Patrick Peters, H. Pfof, <i>Lehrstuhl fur dampf-und gas turbinen, Bochum, Germany</i>		16:00	ATI-CST-050/01 Numerical Simulation of Cavitating Flow in an Inducer Geometry O. Coutier-Delgosha, R. Fortes-Patella, <i>LEGI / INPG, Grenoble Cedex 9, France</i> ; J.L. Reboud, <i>ENISE, St. Etienne, France</i> ; N. Hakimi, <i>NUMECA, Brussels, Belgio</i>	
ATI-CST-015/01 Steady-Unsteady Measurements of the Flowfield Downstream of a Transonic HP Turbine Stage Guillermo Paniagua, Rémy Denos, Tony Arts, <i>Von Karman institute for fluid dynamics, Rhode St Genèse, Belgium</i>		16:30	ATI-CST-051/01 Aerodynamic Design of the Upper Stage "Ariane 5" LOX Turbopump Using CFD Techniques Andrea Arnone, Paolo Boncinelli, <i>Dipartimento di Energetica "Sergio Stecco", Università di Firenze, Firenze, Italy</i> ; Michela Avalle, Andrea Capuani, Ennio Spano, <i>FIAT Avio, Torino, Italy</i>	
ATI-CST-012/01 Impact of the Deterministic Correlations on the Steady Flow Field Fabien Bardoux, <i>SNECMA-Moteurs, Compressor Aerodynamics Department, Roissy Cramayel, France</i> ; Francis Leboeuf, <i>Ecole Centrale de Lyon, LMFA, Ecully, France</i>		17:00	ATI-CST-052/01 Numerical Simulation of the Flow in a Boiler Circulating Pump Sven Baumgarten, Jochen Fritz, Claus Knierim, <i>KSB Aktiengesellschaft, Frankenthal, Germany</i> ; Thomas Mueller, <i>Gim Industries Inc., Grovetown, USA</i>	
ATI-CST-014/01 Gust and Forcing Function in a Transonic Turbine Kai Freudenreich, Markus Joecker, Torsten Fransson, <i>Royal Institute of Technology, Stockholm, Sweden</i>		17:30	ATI-CST-053/01 Prediction of BPF Pressure Pulsation Field in Centrifugal Pumps and Ventilators S. Timouchev, <i>InteRe Ltd., Moscow Reg., Russia</i> ; J. Tourret, <i>CETIM, Acoustical Dept., Senlis Cedex, France</i>	
20:00 - Conference Gala Dinner				

Thursday, March 22, 2001

Morning

<p>A-07 - Unsteady Flows and Aeroelasticity Leonardo room Chairman: T. Fransson (S)</p>		<p>Brunelleschi room B-07 - Optimal Design Chairman: R. Van den Braembussche (B)</p>
<p>ATI-CST-089/01 Stator Wake Propagation Inside Rotating Blade Passages Measured by LDA Ingolf Lehmann, Eberhard Wolf, K. Vogeler, <i>Technische Universität Dresden, Dresden, Germany</i></p>	<p>8:30</p>	<p>ATI-CST-037/01 Systematic Two-Dimensional Cascade Optimization for Axial Flow Pumps Using Genetic Algorithms Ernesto Benini, Andrea Toffolo, <i>Dept. Of Mechanical Engineering, University of Padova, Padova, Italy</i></p>
<p>ATI-CST-091/01 Experimental and Numerical Investigation of the Time-Dependent Flow Through a Tandem-Cascade with a Pitching Airfoil Martin Schuster, Ferdinand Werdecker, Chaoxiang Yang, Rudolf Schilling, <i>Institute for Hydraulic Machinery and Plants, University of Technology Munich, Garching, Germany</i></p>	<p>9:00</p>	<p>ATI-CST-038/01 A Multi-Objective Evolutionary Algorithm for the Optimization of Swept Pump Impellers Wolfgang Glas, Helmut Jaberg, <i>Institute for hydraulic fluidmachinery, TU Graz, Graz, Austria</i></p>
<p>ATI-CST-090/01 Stator Clocking Effect on Efficiency of a Two-Stage Low-Pressure Model Turbine J. Krysinski, Jaroslaw Blaszcak, Antoni Smolny, <i>Institute of Turbomachinery J-10 Technical University of Lodz, Lodz, Poland</i></p>	<p>9:30</p>	<p>ATI-CST-039/01 Expert System for Radial Impeller Optimizatin R. Cosentino, Zuheyr Alsalihi, René Van den Braembussche, <i>Von Karman Institute, Rhode Saint Genese, Belgium</i></p>
<p>ATI-CST-088/01 Simulation of Propfan Forced Response using a Direct Fluid-Structure Coupling Method Stefan Schmitt, Frank Eulitz, Dirk Nuernberger, Volker Carstens, Joachim Belz, <i>DLR -German Aerospace Center, Institute of Propulsion Technology, Koln, Germany</i></p>	<p>10:00</p>	<p>ATI-CST-040/01 Propfan Optimization Based on the Inverse Problem Adjoint Equations Michele Ferlauto, Angelo Iollo, Luca Zannetti, <i>Dipartimento di Ingegneria Aeronautica e Spaziale Politecnico Torino, Torino, Italia</i></p>
<p>10:30 - Coffee Break</p>		
<p>A-08 - Steam Turbines III Leonardo room Chairman: R. Decuyper (B)</p>		<p>Brunelleschi room B-08 - Turbomachinery Design and Analysis Chairman: D. Bohn (D)</p>
<p>ATI-CST-071/01 A Study of the Effects of Geometrical Changes on Wetness in Low Pressure Turbine U. Singh, <i>De Montfort University, Leicester, UK</i></p>	<p>11:00</p>	<p>ATI-CST-078/01 Robust Validation of Measurements on Jet Engines Pierre Dewallef, Olivier Leonard, <i>Université de Liège-Service de Turbomachines et Propulsion-Institut de mecanique et genie civil (B52), Liege 1, Belgium</i></p>
<p>ATI-CST-073/01 Development and Research of the Punched Screens for Increase and Downturn of Erosive Wear of Last Stages of Condensed Type Team Turbines Azcaday Zariankin, Rossikhin Yu, <i>Moskow Power Engineering Institute, Moskow, Russia</i>; Boris Simonov, <i>Innovation Agency, Moskow, Russia</i></p>	<p>11:30</p>	<p>ATI-CST-079/01 Numerical Investigation of the 3D Flow Around NREL Untwisted Wind Turbine Blades Shun Kang, Charles Hirsch, <i>Fluid Mech. Dept., Stro, VUB, Brussel, Belgium</i></p>
<p>ATI-CST-072/01 Preliminary Experimental Investigation of Flow Structure in the Last Stage of a Full Scale Steam Turbine Pavel Jonas, Oton Mazur, Vaclav Uruba, <i>Insitute of Thermomechanics, Academy of Sciences of the Czech Republic, Prague 8, Czech Republic</i></p>	<p>12:00</p>	<p>ATI-CST-080/01 A Novel Blade-path Design System for Advanced Steam Turbines Mathias Deckers, Ernst Pfitzinger, Volker Simon, <i>Siemens AG Power Generation (KWU), Muelheim an der Ruhr, Germany</i>; Simon Hadden, <i>Siemens Power Generation, C.A. Parsons Works, Newcastle upon Tyne, England</i></p>
<p>12:30 - Lunch</p>		

Thursday, March 22, 2001

Afternoon

A-09 - Unsteady Flows - II Leonardo room Chairman: A. Boelcs (CH)		Brunelleschi room B-09 - Noise Chairman: W. Neise (D)
ATI-CST-087/01 Calculation of the Stator-Rotor Interaction of a Transonic Turbine Stage using an Innovative Unsteady Flow Solver Paul Pieringer, Arno Gehrer, Wolfgang Sanz, <i>Institute for Thermal Turbomachinery and Machine Dynamics- Graz University of Technology, Graz, Austria</i>	14:00	ATI-CST-033/01 Acoustic Investigation at the Inlet and the Outlet of a Single Stage Centrifugal Compressor for High Pressure Ratio Heinz Feld, Rolf Girsberger, <i>ABB Turbo Systems Ltd, Baden, Switzerland</i>
ATI-CST-086/01 LES of Wake-Blade Interference Mario Opiela, Matthias Meinke, Wolfgang Schroeder, <i>Aerodynamisches Institut RWTH, Aachen, Germany</i>	14:30	ATI-CST-034/01 Study on the Validity of a 2D CFD Method for Prediction of Turbomachinery Compressor Tone Noise Stephane Perrin-Decroux, <i>Turbomeca in detachment at ONERA-CERT de Toulouse, Toulouse, France</i> ; Gilles Rahier, <i>ONERA-DSNA, Chatillon-cedex, France</i> ; Marie-Laure Ortiz, <i>TURBOMECA DE/SAT, France</i> ; Simone Pauzin, <i>ONERA-DMAE, Centre de Toulouse, Toulouse-cedex, France</i>
ATI-CST-084/01 Steady and Unsteady Traverse Measurements on a Transonic Industrial H.P. Turbine Stage S. Anderson, <i>Propulsion and Performance Department, Defence Evaluation & Research Agency, Farnborough, UK</i> ; B. Pendery, <i>Alstom Power, LE8 6LHLeicester, UK</i>	15:00	ATI-CST-035/01 Predictions of Multiple Tone Noise and Distortion Noise in a Transonic Fan Using Unsteady CFD I. Dupere, W. Dawes, <i>Engineering Department, Cambridge University, Cambridge, UK</i> ; B. Tester, A. Wilson, <i>Rolls Royce plc., Derby, UK</i>
ATI-CST-085/01 Development of an Unsteady Parallel Approach for 3D Stator-Rotor Interaction Paolo Adami, Elisabetta Belardini, Francesco Martelli, <i>Energetics Department "S. Stecco" - University of Florence, Firenze, Italy</i>	15:30	ATI-CST-036/01 Theoretical and Experimental Investigations of Noise Reduction in a Radial Pump Diffuser with Swept Leading Edge Design Stephan Bross, Peter Amann, Bernd Mueller, <i>KSB Aktiengesellschaft, Frankenthal, Germany</i>
16:00 - Coffee Break		
A-10 - Axial Turbine Aerodynamics - III Leonardo room Chairman: J.P. Van Buijtenen (NL)		Brunelleschi room B-10 - Special Configurations Chairman: H. Peters (D)
ATI-CST-016/01 Turbine Stage Optimization by Means of a Full 3D Blade Design Concept René Van den Braembussche, Claus Sieverding, <i>Von Karman Institute for Fluid Dynamics, Rhode Saint Genese (Brussels), Belgium</i> ; Luigi Maretto, A. Sabattini, <i>Ansaldo Energia Spa, Genova, Italy</i>	16:30	ATI-CST-061/01 Making Steam Turbines Competitive in the Deregulated Electricity Market Artur Ulbrich, Edwin Gobrecht, Norbert Henkel, <i>Siemens AG Power Generation (KWU), Mulheim a.d. Ruhr, Germany</i>
ATI-CST-018/01 Progressive Optimisation for a Fast Design of 2D Turbine Blades L. Catalano, <i>Ist. di Macchine ed Energetica, Politecnico di Bari, Italy</i>	17:00	ATI-CST-062/01 Experimental Investigation of CA9 Blades on a 0.6m Wells Turbine Rig Ajit Thakker, Pat Frawley, E. Bajeet, <i>Department of mechanical and aeronautical engineering - University of Limerick, Limerick, Ireland</i>
ATI-CST-017/01 An Implicit Fluctuation Splitting Scheme For Turbomachinery Flows A. Bonfiglioli, P. De Palma, G. Pascazio, M. Napolitano, <i>Istituto di Macchine ed Energetica, Politecnico di Bari, Italy</i>	17:30	ATI-CST-063/01 Performance Simulation of a CA9 Wells Turbine Rotor using a 3D Navier-Stokes Explicit Solver Ajit Thakker, Pat Frawley, E. Bajeet, John Daly, <i>Department of mechanical and aeronautical engineering - University of Limerick, Limerick, Ireland</i>

Friday, March 23, 2001

Morning

A-11 - Axial Turbine Aerodynamics - IV Leonardo room Chairman: C. Sieverding (B)		Brunelleschi B-11 - Axial Compressor Aerodynamics - II room Chairman: L. Fottner (D)
ATI-CST-022/01 Effect of Trailing Edge Cooling Flow on Turbine Wake Unsteady Flow Characteristics Marina Ubaldi, Pietro Zunino, Andrea Cattanei, Ugo Campora, Dipartimento di Macchine, Sistemi energetici e Trasporti Università di Genova, Genova, Italy	8:30	ATI-CST-005/01 Effects of Blade Sweep in a High Performance Axial Flow Rotor Alessandro Corsini, Janos Vad, Franco Rispoli Dept. Mechanics & Aeronautics-URLS, Roma, Italy; Ferenc Bencze, Dept. Of Fluid Mechanics, Budapest University of Technology and Economics, Hungary
ATI-CST-020/01 Experimental and Numerical Investigation of a Technically Rough Turbine Blade Cascade Ulrich Harbecke, W. Riess, Institute of Turbomachinery University of Hannover, Hannover, Germany	9:00	ATI-CST-007/01 Single-Passage Solution of Three-Dimensional Unsteady Flows in a Transonic Fan Rotor Haidong Li, Li He, University of Durham, Durham, UK
ATI-CST-019/01 Experimental and Numerical Evaluation of Non-Reflecting Porous Tailboards for Transonic Cascades Wind Tunnels A. Rona, Department of Engineering, Leicester, UK; R. Paciorni, F. Sabetta, Dipartimento di meccanica ed aeronautica, Roma, Italy	9:30	ATI-CST-004/01 The Calibration of Probe for Measurement of the Total Temperature of Compressible Fluid Flow Jiri Nozicka, Div. of Fluid Dynamics and Thermodynamics, Czech Technical University in Prague, Praha 6, Czech Republic
ATI-CST-021/01 Effect of Gas and Surface Temperatures on Particle Deposition on Turbine Blades Hesham El-Batsh, Hermann Haselbacher, Institute of Thermal Turbomachines and Powerplants, Wien, Austria	10:00	ATI-CST-006/01 Tip Clearance Flow in a Low-Speed Compressor and Cascade Horst Saathoff, Udo Stark, Institut für Stromungsmechanik, Braunschweig, Germany
10:30 - Coffee Break		
A-12 - Transition and Turbulence Modelling Leonardo room Chairman: V. Michelassi (I)		Brunelleschi B-12 - Performance Testing and Monitoring room Chairman: M. Stastny (CZ)
ATI-CST-074/01 Numerical Simulation of Wake Velocity and Wake Turbulence Effects on Unsteady Boundary Layer Transition Jens Thurso, B. Stoffel, Laboratory for Turbomachinery and Fluid Power TFA, Darmstadt University of Technology, Darmstadt, Germany	11:00	ATI-CST-041/01 Simplified Simulation Block Diagram for Heavy-Duty Gas Turbines Luca Bozzi, Giampaolo Crosa, Dimset Università di Genova, Genova, Italy
ATI-CST-075/01 Aero-Thermal Predictions with Transition Models for HP Turbine Blades Jean Michel Roux, Patrice Mahé, Benjamin Sauthier, Jean Marc Duboué, Snecma Moteur, Moissy-Cramayel, France	11:30	ATI-CST-045/01 Performance Analysis of a Gas Turbine Burning Low LHV Gaseous Fuels Giampaolo Crosa, Univ. Di Genova - DIMSET, Genova, Italy
ATI-CST-076/01 Combination of a Transition Model with a Two-Equation Turbulence Model and Comparison with Experimental Results Edmund Kuegeler, Anton Weber, Institute of Propulsion Technology German Aerospace Center, Koeln, Germany; Stephan Lisiewicz, Rolls Royce Deutschland GmbH, Dahlewitz, Germany	12:00	ATI-CST-044/01 Time-Resolved Simulation of the Operational Behaviour of a Test Turbine Facility Fritz Neumayer, Institute for Thermal Turbomachinery and Machine Dynamics, Technical University, Graz, Austria
ATI-CST-077/01 Interaction Between a Laminar Separation Bubble and a Turbulent Spot Under a Strong Adverse Pressure Gradient Alberto D'Ovidio, J. Harkins, J. Gostelow, University of Leicester, Leicester, UK	12:30	ATI-CST-042/01 Multifun - The System of Diagnosis with a Preliminary Balancing Calculation for the Online-Diagnosis of Thermal Power Plants Dietmar Reiss, Universität Stuttgart, Stuttgart, Germany; Heinz Stetter, Institute for Thermal Turbomachinery and Machinery Laboratory, Stuttgart, Germany
	13:00	ATI-CST-043/01 On Proper Conditions for Performance Monitoring of Large Steam-Power Systems Jerzy Krzyzanowski, Jerzy Gluch, Institute of Fluid-Flow Machinery, Polish Academy of Sciences, Gdansk, Poland
13:30 - Lunch		
Afternoon - Technical Visits		

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Florence Map

