



UNIVERSITY OF NAPLES FEDERICO II
SCHOOL OF POLYTECHNIC AND BASIC SCIENCES

Department of Structures for Engineering and Architecture

Department of Chemical, Materials and Industrial Production Engineering

13th International Aluminium Conference

INALCO

n a p l e s 2 0 1 6

New structures for aluminium and
new aluminium for structures

NAPLES - ITALY
SEPTEMBER 21-23

PROGRAMME



FOREWORD

The “13th International Aluminium Conference” is organized in Naples on 21-23 September, 2016 by the Department of Structures for Engineering and Architecture and the Department of Chemical, Materials and Industrial Production Engineering of the University of Naples “Federico II”.

The first international conference on welded products and constructions with aluminium alloys was held in Cleveland (USA) in 1979. It became established as INALCO at the 2nd conference in Munich in Germany in 1982. Since then, these conferences have been held every three years in different venues all over the world. The latest editions were held in Osaka (Japan, 2007), Eindhoven (The Netherlands, 2010) and Montreal (Canada, 2013).

The INALCO Conference aims at presenting relevant topics for various aluminium products and constructions such as: Technology, Structural Behaviour and Applications, Architecture, Environment and Techno-Ecology. The programme will consist of keynote lectures by invited speakers as well as oral and poster presentations of papers submitted by attendees.

This Conference is a gathering of academics, research and development professionals, sales and marketing executives, plant and industrial engineers, quality-control managers, packaging experts, and other prominent aluminium industry leaders.

The results of recent research activity from all over the World in the field of aluminium constructions are represented by 71 papers of experts from 24 Countries (Algeria, Austria, Belgium, Brazil, Canada, China, Croatia, Finland, France, Germany, Greece, Italy, Japan, Montenegro, Norway, the Netherlands, Poland, United Kingdom, Serbia, Slovakia, Spain, United States, Sweden, Hungary). The papers included in the proceedings are subdivided in Chapters and the same subdivision corresponds to the Working sessions of the 13th INALCO Conference. The working sessions are categorized into the following areas:

1. New trends of aluminium alloys constructions
2. Advanced connecting systems

3. Aluminium surface treatments
4. Numerical and experimental analysis methods
5. Structural capacity of aluminium elements
6. Large span structures
7. Codification

The programme will consist of oral and poster presentations. Three out-standing international experts are invited as keynote speakers: Michele Curioni, from the University of Manchester (UK), who treats the question “Will *Aluminium* Structures last forever?”; Dimitris Kosteas, from the Technical University of Munich (Germany), who reports on the general issue “Sustainability, Durability and Structural Advantages as Leverage in Promoting *Aluminium* structures”; Steinar Lundberg, from the Hydral Aluminium Profiler company (Norway), who illustrates the main advances in the “Use of *Aluminium* Structures in the Offshore industry”.

The Chairs wish a great success to this INALCO Conference edition, which for the first time joins together the world of Structural Engineering to the world of Technological Engineering, for enhancing every way of a more fruitful cooperation among all involved stakeholders, like scientists, professionals, associations, companies, operating in the field of the development, promotion, diffusion of the aluminium alloy constructions, with the consciousness that only through this synergy it is possible to face such an enthusiastic challenge.

Federico M. Mazzolani

Francesco Bellucci




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Conference secretariat



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GENERAL INFORMATION

CONFERENCE DATES

September 21 - 23, 2016
Napoli, Italy

CONFERENCE VENUE

School of Polytechnic and Basic
Sciences, College of Engineering,
P.le V. Tecchio, 80 - 80125 Napoli, Italy

ON-SITE SECRETARIAT

September 21, Wednesday 08:00-18:00
September 22, Thursday 08:30-18:00
September 23, Friday 08:30-14.00

ON-SITE REGISTRATION FEES

Regular Participants € 700,00
Students* € 500,00
* (for participants born in 1983 or later)

*Please note that registration fees
include VAT 22% as per Italian Law.*

The registration fees include:

Regular Participants/Students

- Badge and admission to all Sessions
- Lunches
- Coffee breaks
- Final program and proceedings volume
- Welcome cocktail on September 21
- Social dinner on September 22

Registration fee does not cover:

- Accommodation
- Meals and drinks, other than those provided as part of the conference program

OFFICIAL LANGUAGE

The official language of the Conference is English; please, note that translation facilities will not be provided.

CONFERENCE BADGE

Everyone is kindly requested to wear his/her name badge during the Conference as it provides access to the scientific sessions, lunches, coffee breaks and welcome cocktail.

LUNCHEES AND COFFEE BREAKS

Coffee breaks and lunches will be served during the conference days according to the program timetable.

INTERNET

Free Wireless internet access will be available at the conference venue.

ORAL PRESENTATIONS

Time at disposal for oral presentation is 12 minutes plus 3 minutes for discussion.

Audiovisual facilities will be available (PC with Power Point and videoprojector).

SLIDES CENTER

Technicians will be at your service at the following hours:

September 21, Wednesday 08:00-17:00

September 22, Thursday 08:30-17:00

September 23, Friday 08:30-13:00

All Speakers should check and upload their presentation not less than 1 hour before the beginning of their session. Speakers at the morning sessions are required to upload their slides no later than h. 17:00 on the day before their session is scheduled.

POSTER PRESENTATIONS

The Poster exhibition will be available during the whole conference.

The Poster presentation by Authors will be held on Thursday, September 22 from h. 14.15 to 16.00 in the room "Biblioteca F. Gasparini".

On that occasion authors are kindly requested to be at their poster for poster discussion.

SOCIAL PROGRAMME WELCOME COCKTAIL

Date and time: Wednesday,
September 21 / 19:00-20:00

Venue: Hotel Palazzo Esedra

Address: P.le V. Tecchio, 50 Napoli
(just opposite the Conference venue)

Dress code: smart casual

GALA DINNER

Date and time: Thursday, September
22 / 20:00-23:00

Venue: Bertolini's Hall

Address: Corso Vittorio Emanuele,
165/b Napoli

Additional tickets can be purchased at the secretariat desk by Wednesday September 21 at h. 16:00, upon availability of places. The price of the ticket is € 90,00

Dress code: Formal

Kindly offered by **Laminazione Sottile.**

HOW TO REACH THE CONFERENCE VENUE

The best way to reach the conference venue is the Underground (M) Line 2 with stop at the Campi Flegrei Station.

A public bus transportation service is available throughout the city. Find your route to the Conference Venue at the following website: www.anm.it. On the same website information and maps of Undergrounds, Buses, Cable Cars are available.

Several taxi companies are available from taxi stations throughout the city and at the following phone numbers:

081 202020

081 5707070

081 5666666

GENERAL PROGRAMME

Wednesday, September 21, 2016

8.00	Registrations
9.00 - 9.30	Opening ceremony
9.30 - 10.15	Keynote 1 Michele Curioni
10.15 - 10.45	<i>Coffee break</i>
10.45 - 12.45	Numerical and experimental analysis methods
12.45 - 13.00	Sponsor talk
13.00 - 14.00	<i>Lunch</i>
14.00 - 16.00	New trends in design and production of aluminium alloys constructions
16.00 - 16.30	<i>Coffee break</i>
16.30 - 18.15	Large span structures
19.00 - 20.00	<i>Welcome cocktail</i>

Thursday, September 22, 2016

9.00 - 9.45	Keynote 2 Dimitris Kosteas
9.45 - 10.45	Advanced connecting systems 1
10.45 - 11.15	<i>Coffee break</i>
11.15 - 13.15	Structural capacity of aluminium elements
13.15 - 14.15	<i>Lunch</i>
14.15 - 14.30	Sponsor talk
14.30 - 16.00	Poster Session
15.30 - 16.00	<i>Coffee break</i>
16.00 - 18.00	Aluminium Surface treatments
20.00	<i>Gala Dinner</i>

Friday, September 23, 2016

9.00 - 9.45	Keynote 3 Steinar Lundberg
9.45 - 10.45	Advanced connecting systems 2
10.45 - 11.15	<i>Coffee break</i>
11.15 - 13.15	Codification
13.15 - 13.30	<i>Closing session</i>

PROGRAMME

WEDNESDAY, SEPTEMBER 21

- 08.00 Registrations**
- 09.00 - 09.30 Room Aula Magna - Opening ceremony**
- Gaetano Manfredi**
Rector of the University of Naples Federico II
- Piero Salatino**
President of the School of Polytechnic and Basic Sciences
- Francesco Bellucci**
Co-Chair
- Federico M. Mazzolani**
Chair
- 09.30 - 10.15 KEYNOTE 1** *Chair: Airan Perez*
- Will Aluminium Structures Last Forever?**
Michele Curioni
(University of Manchester, Corrosion and Protection Centre, UK)
- 10.15 - 10.45 Coffee break**
- 10.45 - 12.45 NUMERICAL AND EXPERIMENTAL ANALYSIS METHODS**
Chairs: Ivan Balaz, Alberto Mandara
- Proposal for an Empirical Evaluation of Rotation Capacity of RHS Aluminium Alloy Beams Based on FEM Simulations**
Paolo Castaldo, Elide NASTRI, Vincenzo Piluso
- Numerical analysis of aluminium perforated shear panels**
Giuseppe Brando, Gianfranco De Matteis

Microstructure and Mechanical Properties of a New Secondary AISi10MnMg(Fe) Alloy for Ductile High Pressure Die Casting Parts for the Automotive Industry

Andrea Niklas, Asier Bakedano, Sergio Orden, Eulalia Nogués, Manel da Silva, Ana Isabel Fernández-Calvo

Numerical non-linear behaviour of aluminium perforated shear walls: a parametric study

Antonio Formisano, Federico M. Mazzolani

FE Simulation of Residual Welding Stresses: Aluminium and Steel Structural Components

Peter Knoedel, Stefanos Gkatzogiannis, Thomas Ummenhofer

End-Plate Connections in Bi-Axial Bending - Measurements

Jari Mäkinen, Keijo Fränti, Matti Korhonen, Joshua Fillion, Markku Heinisuo

Evaluation of Rotation Capacity of RHS Aluminium Alloy Beams by FEM Simulation: Temper T4 and Temper T6

Paolo Castaldo, Elide NASTRI, Vincenzo Piluso

Numerical/experimental research on welded joints in aluminium truss girders

Dianne van Hove, Frans Soetens

12.45 - 13.00 Sponsor Talk: Innovation Management

Marco Frizzarin (AYMING)

13.00 - 14.00 Lunch

14.00 - 16.00 NEW TRENDS IN DESIGN AND PRODUCTION OF ALUMINIUM ALLOYS CONSTRUCTIONS

Chairs: Tullio Monetta, Victor Songmene

Overview of the correlations between process parameters, microstructure and mechanical properties of Reference castings and industrial demonstrators

Eleonora Battaglia, Franco Bonollo, Elena Fiorese, Giorgio Kral

Characterization of innovative Al-Si-Mg-based alloys for high temperature applications.

Elisabetta Gariboldi, Marco Colombo

Incremental ECAP as a method to produce ultrafine grained aluminium plates

Malgorzata Lewandowska, Witold Chrominski, Marta Lipinska, Lech Olejnik, Andrzej Rosochowski

Design of Functionally Graded Beam of Aluminium Foam for Civil Structural Application

Gianpaolo Perrella, Diana Faiella, Giuseppe Brandonisio, Massimiliano Fraldi, Elena Mele

Turning and Drilling Machinability of Recycled Aluminum Alloys

Jean Brice Mandatsy Mougomo, Donatien Nganga Kouya, Victor Songmene

Properties of Aluminium Alloys Produced by Selective Laser Melting

Paola Bassani, Carlo Alberto Biffi, Riccardo Casati, Adrianni Zanatta Alarcon, Ausonio Tuissi, Maurizio Vedani

Research on mechanical and electrical properties of wires made from composites of aluminium-graphene and aluminium-nanotubes

Marek Gnielczyk, Beata Smyrak, Tadeusz Knych, Grzegorz Kiesiewicz, Paweł Kwaśniewski, Andrzej Mamala, Artur Kawecki, Bartosz Jurkiewicz, Małgorzata Zasadzińska

Think light: Cost and weight reduction by choosing Aluminium for Offshore Constructions

Dick de Kluijver

16.00 - 16.30 *Coffee break*

16.30 - 18.15

LARGE SPAN STRUCTURES

Chairs: Randy Kissel, Elena Mele

Rapid Deployment Aluminium Bridge

Alex de la Chevrotière

The use of structural aluminum for the design of large span roofs: the case of the “Cubierta de Oviedo”

Beatrice Faggiano, Giacomo Iovane, Alessia Ricci, Antonino Squillace, Antonello Astarita, Francesco Passeggio, Alfonso F. Cantelli, Federico M. Mazzolani

Aluminium Bridges

Sebastien Joux

Aluminium in modular structures for offshore lifts

Vasiliki Ntaskagianni

Conceptual design of an aluminium bridge in Alma, QC

László Gergely Vigh, Gábor Schnierer, Judit Buchmüller, Ákos Pohl, Bence Turányi, László Kiss, Lyne St-Georges, Louis Dussault

Analysis of lowering effects in aluminum single-layer latticed dome with Temcor joints

Shuai Xu, Zhihua Chen, Federico M. Mazzolani

Structural design and analysis of Aluminum Dome for Caofeidian Coal Storage

Zechao Zhang, Hongbo Liu, Xiaodun Wang, Xiangyu Yan, Jinghai Yu, Zhihua Chen

19.00 - 20.00

Welcome Cocktail

THURSDAY, SEPTEMBER 22

09.00 - 09.45

KEYNOTE 2 *Chair: Ronald Latanision*

Sustainability, Durability and Structural Advantages as Leverage in Promoting Aluminium Structures

Dimitris Kosteas (Technical University of Munich, Germany)

09.45 - 10.45

ADVANCED CONNECTING SYSTEMS 1

Chairs: Johan Maljaars, Vincenzo Piluso

Performance of friction stir welded tailor welded blanks in AA5059 and AA6082 alloys for marine applications

Eduardo E. Feistauer, Luciano Bergmann, Jorge F. dos Santos

Practical Design of Aluminium Silos according to EC9-1-5

Peter Knoedel, Thomas Ummenhofer

Pull-Out Strength of Screws in Screw Chases: Part 1

James C. LaBelle, P.E., Doc.E., J. Randolph Kissell, P.E., Tanya A. Dolby, P.E.

Pull-Out Strength of Screws in Screw Chases: Part 2

James C. LaBelle, P.E., Doc.E., J. Randolph Kissell, P.E., Tanya A. Dolby, P.E.

10.45 - 11.15

Coffee break

11.15 - 13.15

STRUCTURAL CAPACITY OF ALUMINIUM ELEMENTS

Chairs: Gianfranco De Matteis, Dianne Van Hove

Torsional-Flexural Critical Force for Various Boundary Conditions

Ivan Baláž, Michal Kováč, Tomáš Živner, Yvonna Koleková

Materials Performance and Design analysis of Suspension Lower-Arm Fabricated from Al-Si-Mg Castings

Khaled Ahmed Ragab, Mohamed Bouazara, Amine Bouaicha, Hatem Mrad

Novel Morphologies of Aluminium Cross-Sections through Structural Topology Optimization Techniques

Lukas Grekavicius, Jack Antony Hughes, Konstantinos Daniel Tsavaridis, [Evangelos Efthymiou](#)

Theoretical Analysis of the Possibilities for Aluminium Alloy Beam to be Strengthened Using Elements of Steel

[Boris Gligic](#), Dragan Budjevac, Zlatko Markovic

A simple method for the design of aluminium structures

[Torsten Höglund](#)

Deformation of perforated aluminium plates under in-plane compressive loading

Irene Scheperboer, Evangelos Efthymiou, Johan Maljaars

Plate stability verifications of aluminium plate girders

László Gergely Vigh, [Dib Abdelkarim](#)

13.15 - 14.15

Lunch

14.15 - 14.30

Sponsor talk: ISO 31000, principles and guidelines for risk management. A framework useful for managing the risks associated to the production processes and environmental impact.

Laura Schiavon (CROWE HORWATH AS)

14.30 - 16.00

BIBLIOTECA F. GASPARINI - POSTER SESSION

ADVANCED CONNECTING SYSTEMS

P1

Bearing Capacity of aluminum bars with built-up cross section and glued or welded connections

[Marcin Krajewski](#), Piotr Iwicki

P2

Joining Mechanism of Dissimilar Materials Such As Metal and Plastic Sheets by Friction Lap Joining

[Toshiya Okada](#), Kazuhiro Nakata, Masatoshi Enomoto

NEW TRENDS IN DESIGN AND PRODUCTION OF ALUMINIUM ALLOYS CONSTRUCTIONS

- P3 **Localized corrosion resistance of dissimilar aluminum alloys joined by Friction Stir Welding (FSW)**
Aline F.S.Bugarin, Fernanda M. Queiroz, Maysa Terada, Hercilio G. de Melo, [Isolda Costa](#)
- P4 **Aluminium Footbridges over the Rail Demonstrating Versatility and Economy**
[Dimitris Kosteas](#), Alexandros Kosteas-Kostaropoulos
- P5 **Research on the fatigue strength of aluminium EN AW 1370 wires**
[Bartosz Jurkiewicz](#), Beata Smyrak, Tadeusz Knych, Andrzej Mamala, Andrzej Nowak, Michał Jabłoński, Kinga Korzeń, Marek Gniełczyk, Małgorzata Zasadzińska
- P6 **The influence of strain and precipitation hardening on the mechanical and electrical properties of EN AW 6101 wires**
[Małgorzata Zasadzińska](#), Bartosz Jurkiewicz, Beata Smyrak, Tadeusz Knych, Andrzej Mamala, Michał Jabłoński, Kinga Korzeń, Andrzej Nowak, Marek Gniełczyk
- P7 **Aluminium Machining Chips Formation, Treatment & Recycling: A review**
Jean Brice Mandatsy Mougomo, Donatien Nganga Kouya, [Victor Songmene](#)

NUMERICAL AND EXPERIMENTAL ANALYSIS METHODS

- P8 **Experimental and numerical researches on aluminium alloy systems for structural applications in civil engineering fields**
[Antonio Formisano](#), Gianfranco De Matteis, Federico M. Mazzolani
- P9 **Design and performance testing of a skylight in Qatar**
Muhammad Tayyab Naqash, [Antonio Formisano](#), Gianfranco De Matteis

STRUCTURAL CAPACITY OF ALUMINIUM ELEMENTS

- P10 **Resistances of I-Section to Internal Forces Interactions**
[Ivan Baláž](#), Michal Kováč, Tomáš Živner, Yvonna Koleková
- P11 **Aluminium Framing Members in Facades**
Muhammad Tayyab Naqash, [Antonio Formisano](#), Gianfranco De Matteis
- P12 **Ultimate load bearing capacity of web members of lattice aluminium structures made of CHS profiles**
Djordje Djuricic, Biljana Scepanovic, Mitar Misovic, [Dusko Lucic](#)
- P13 **Low-cycle Fatigue Testing of a Novel Aluminum Alloy Buckling-Restrained Brace**
[Ye Liu](#), Li Zhou, Chun-Lin Wang

ALUMINIUM SURFACE TREATMENTS

- P14 **On the effects of hydrothermal treatments on the corrosion resistance of the TSA anodized AA7475-T761 alloy**
Thallis Leal Almeida, Fernanda Martins Queiroz, Maysa Terada, [Isolda Costa](#), Vera Rosa Capelossi
- P15 **Effect of experimental parameters on passivation phenomena of Ti6Al4V alloy in acid solution**
[E.Nouicer](#), F.Z.Benlahreche, A. Nouicer
- P16 **Hydrothermal surface treatments with Cerium and Glycol molecules on the AA 2024-T3 clad alloy**
Wagner Izaltino Alves dos Santos, [Isolda Costa](#), Célia Regina Tomachuk

15.30 - 16.00 *Coffee break*

16.00 - 18.00 **ROOM AULA MAGNA - ALUMINIUM SURFACE TREATMENTS**

Chairs: Isolda Costa, Ciro Sinagra

Loss of adhesion at Al 8006/LDPE interface in containers for food packaging: a case study

Tullio Monetta, [Annalisa Acquesta](#), Ciro Sinagra, Donald Bryce Mitton, Francesco Bellucci

**On the Investigation of the Portevin-Le Chatelier Effect in
The Rolling Of AA 5083**

Antonello Astarita, Mariacira Liberini, Carla Velotti, Ciro Sinagra,
Antonino Squillace

Coil Coating: the advanced finishing technology

Sergio Bianchi, Fabrizio Broggi

**Green Technology for Surface Treatments of Aluminium Foil
for Flexible Packaging**

Ciro Sinagra, Francesco Bravaccino, Ciro Bitondo, Antonio Bossio,
Tullio Monetta, Donald Bryce Mitton, Francesco Bellucci

**The use of Cold Spray to repair corroded AA6005A-T6 used
for bolt-channel joints**

Antonio Bossio, Ciro Bitondo, Anna Carangelo, Antonio Formisano,
Tullio Monetta, Raffaele Landolfo, Federico M. Mazzolani,
Francesco Bellucci

**Products and Process for Guala Closures: An Overview of
Aluminum Closures Production and the Drive for Innovation**

Francesco Bove, Carlo Tagliabue, Maurizio Mittino

**Corrosion protection of AA2524-T3 anodized in tartaric-
sulfuric acid bath and protected with hybrid sol-gel coating**

Hellen Costenaro, Fernanda Martins Queiroz , Maysa Terada,
Marie-Georges Olivier, Isolda Costa, Hercílio Gomes de Melo

**Production routes for impact extruded aluminum parts for
the automotive industry**

Alexander Wimmer, Bernhard Schwarz

20.00

Gala Dinner

FRIDAY, SEPTEMBER, 23

09.00 - 09.45

KEYNOTE 3 *Chair: Beatrice Faggiano*

Use of aluminium structures in the offshore industry

Steinar Lundberg (*Hydal Aluminium Profiler AS, Norway*)

09.45 - 10.45

ADVANCED CONNECTING SYSTEMS 2

Chairs: Evangelos Efthymiou, Antonino Squillace

**Structural response of aluminium T-stub connections at
elevated temperatures and fire**

Johan Maljaars, Gianfranco De Matteis

**Advances and potentials in Friction Stir Welding of
aluminum alloys**

Jean Pierre Bergmann, Michael Grätzel, René Schürer,
Anna Regensburg, Markus Weigl

Macroscopic Modelling of Flow-Drill Screw Connections

Johan Kolstø Sønstabø, David Morin, Magnus Langseth

**The effects of friction stir welding parameters on the
characteristics of banded structure for aluminum alloys**

Mariem Zoghalmi, Mohammad Jahazim, Victor Songmene

10.45 - 11.15

Coffee break

11.15 - 13.15

CODIFICATION

Chairs: Torsten Höglund, Antonio Formisano

**Analysis of aluminium beam-to-column joints by the
component method: existing studies and research needs**

Gianfranco De Matteis, Giuseppe Brando

**Direct methods of plasticity in aluminium frames accounting
for Eurocode 9 failure criteria**

Alexios T. Ampatzis, Vasileios G. Psomiadis, Evangelos Efthymiou

Bearing length on cold-formed sections

Bert Norlin, [Torsten Höglund](#)

Recent Developments in North American Aluminum Structural Design Codes

[J. Randolph Kissell](#)

EC9 Second Generation: Proposal for New Imperfection Factors for Unstiffened Aluminium Shells

Federico M. Mazzolani, Torsten Höglund, [Alberto Mandara](#)

(Low-Cycle-) Fatigue Design according to DIN EN 1999-1-3. State of the Art and Current Research

Christina Radlbeck, [Mathias Rengstl](#), Senta Pessel, Martin Mensinger

Lateral torsional buckling of split aluminium mullion

[Davor Skejić](#), Mladen Lukić, Nebojša Buljan, Hrvoje Vido

Recent Development of Codes for Design of Aluminum Structures in Canada

Scott Walbridge, Denis Beaulieu, Federico M. Mazzolani

13.15 - 13.30

Closing session

Under the auspices of

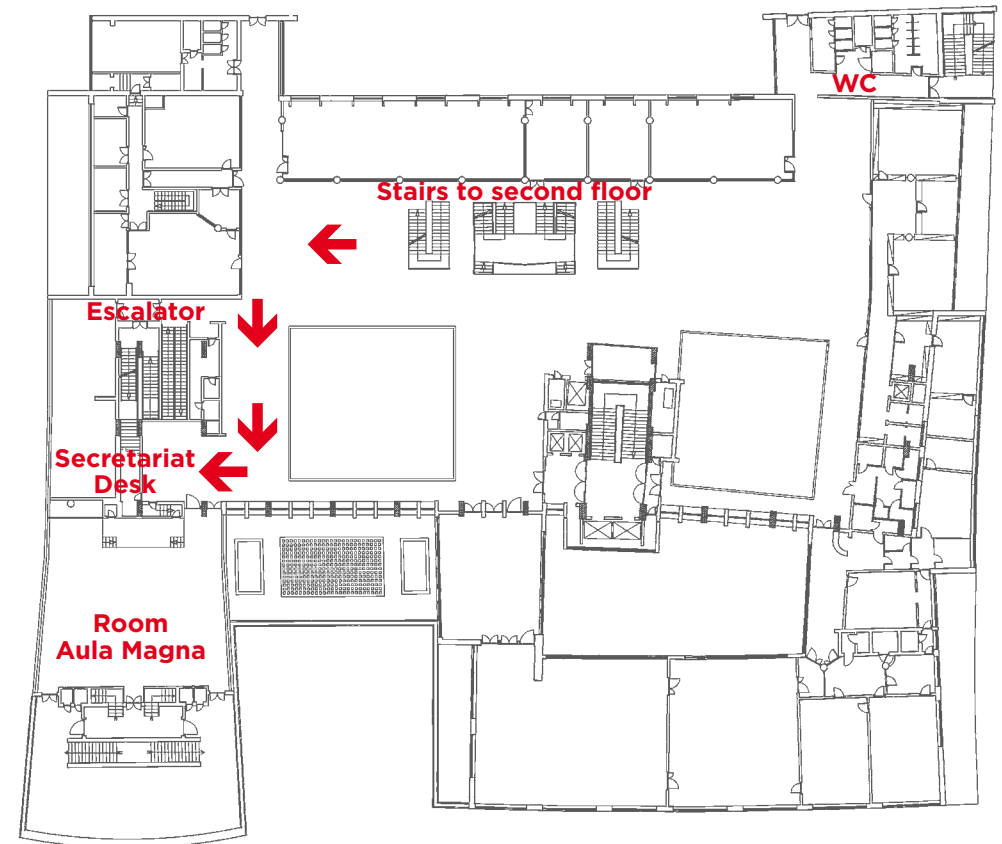
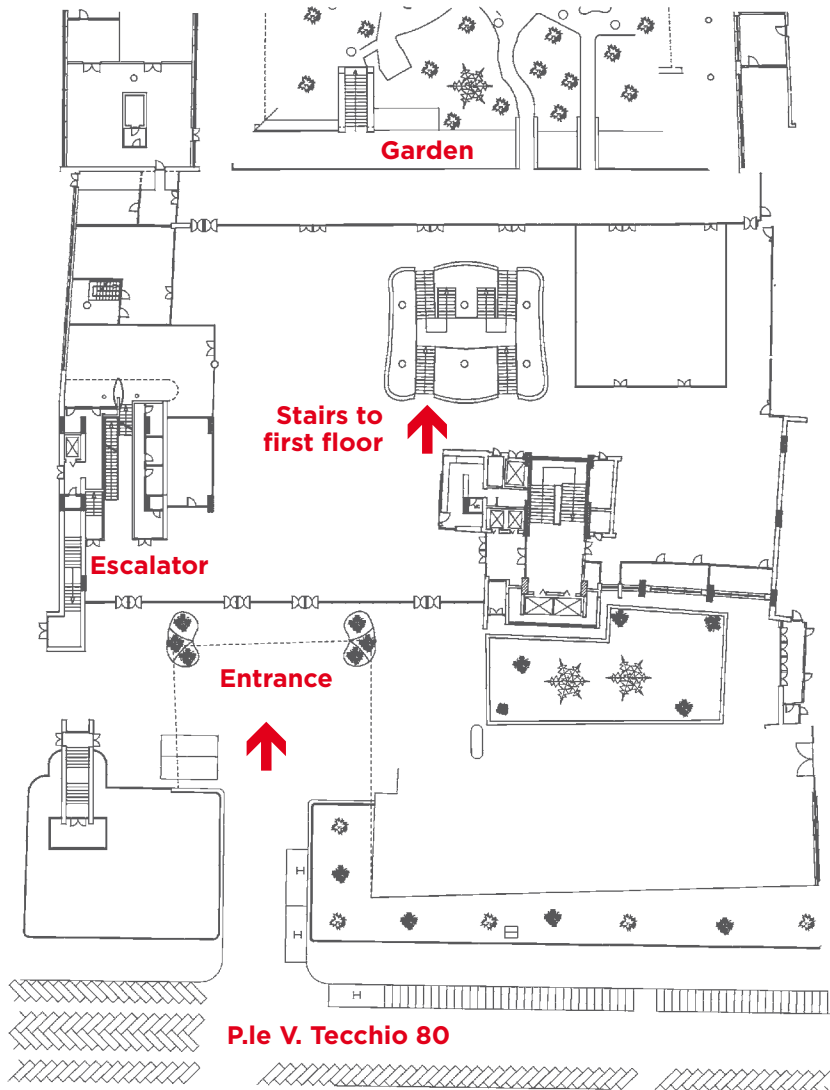


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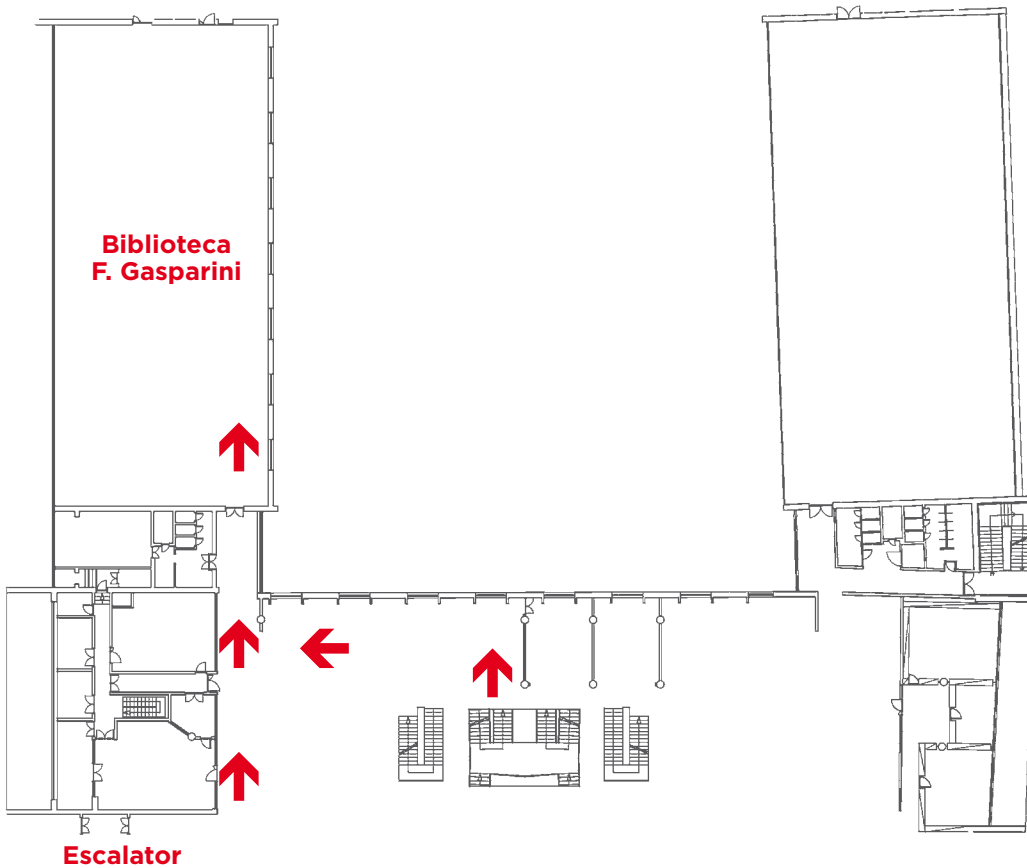


SCHOOL OF POLYTECHNIC AND BASIC SCIENCES
GROUND FLOOR

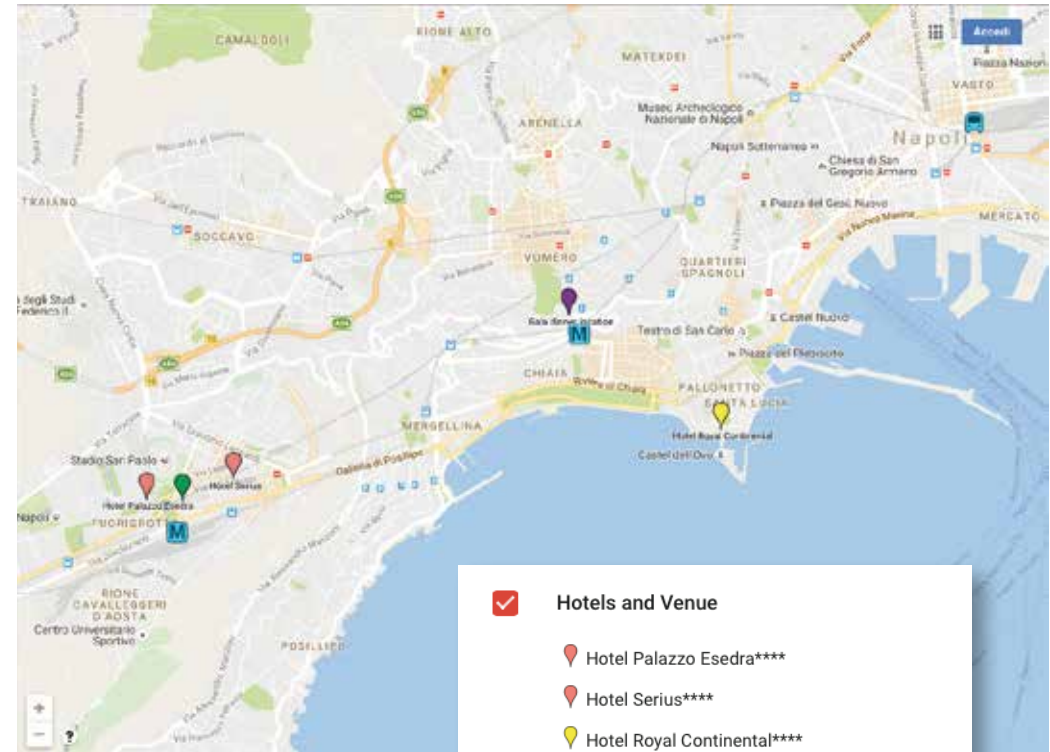
FIRST FLOOR



SECOND FLOOR



CITY MAP



- Hotels and Venue**
 - 📍 Hotel Palazzo Esedra****
 - 📍 Hotel Serius****
 - 📍 Hotel Royal Continental****
 - 📍 The School of Polytechnic and Basic Scien...
 - 📍 Bertolini'S Hall Srl
- Public Transportation**
 - ✈️ Aeroporto Internazionale di Napoli
 - M Piazza Amedeo Underground (M)
 - M Campi Flegrei Underground (M)
 - 🚆 Stazione di Napoli Centrale

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