



POLITECNICO
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The
Rector

Lady Minister,

Mr President of the Lombardy Region,

Mr Mayor, Civil, Military and Religious Authorities,

Dear Rectors,

Dear Professors, Technical and Administrative Staff, Students,

Ladies and Gentlemen,

I am extremely pleased to see you all here for the opening of the Politecnico's academic year 2022/23, an institution that has 160 years of history behind it. It is very similar to the way I felt back in 2017 when I first set foot onto this stage as rector. Since then, six years have elapsed, filled with joy and satisfaction for the results achieved, but also worries and anxiety for the dramatic moments we have been through together. And have overcome together.

All of you without fail have helped Politecnico di Milano, our students, our researchers... and me. Many thanks for what you have done for an institution that is (and will always be) at the service of research, education and knowledge, for the city of Milan, the Lombardy Region, Italy and indeed Europe.

Thank you for being there, and for being here today, for wishing to look forward with optimism, despite the complex and fragile nature of the times we are living in. There are emotions that we have been unable to leave behind us. We continue to live in times of great uncertainty. Both in the short term: the conflict in Europe, the energy crisis with the winter now upon us; and in the medium term: a new form of globalization, and the effects of technological evolution, taking directions that we are unable to foresee.



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Yet back in 2017, at the outset of this rectorate, everything appeared to be well balanced: citizens of the world were lulled by a sense of general wellbeing, distracted by a high quality of life, reassured by technologies that seemed to be unlimited.

This balance then came undone.

If we only look at Europe in the past six years, we have experienced Brexit, a pandemic, mass vaccine campaigns, an economic recovery too fierce to be kept under control. Then came the energy crisis, the raw materials crisis, natural disasters, climate disasters (floods in Germany, fires in France, the collapse of the glacier in the Dolomites). Then came the war in Ukraine.

The balance came undone, due to instability.

Researchers who study system dynamics are well aware of the definition of unstable equilibrium: “a system is said to be in unstable equilibrium when it deviates slightly from its position, and inexorably tends to move further away, to diverge, to fluctuate from one extreme to another”.

We definitely had an unstable equilibrium, with limits exceeded and no control over the consequences. In this definition, the concepts of balance and limit are intricately linked.

The areas of engineering, architecture and design are perfectly aware of the meaning of limit. There is for instance the limit of the strength of a material... The limit between real and virtual, as dictated by algorithms and AI devices... The limit traced by the architect or designer's pencil when conceiving designs focusing on the balance and harmony of spaces...



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The university too must live close to the limit: on the edge.

It is our task to push ourselves towards the limits of knowledge, seeking quality, growth, knowledge and the wellbeing of society. It is our task to overcome those limits, but also to evaluate the consequences and the stability of the new balance we are seeking to create.

There are limits of course that must remain fixed. My thoughts go to the repression of so many youngsters in Iran who have taken to the streets in defence of their rights, or to the sovereign limits of a democratic state that have been violated in the heart of Europe.

Facing up to the limit means reaching a precarious state of balance, somewhere between boldness and awareness, between freedom and respect, between the future and traditions.

We at Politecnico di Milano have experienced difficult times recently, and taken difficult decisions, with the aim of re-establishing a balance within our community, starting with education and training, which remain our prime responsibility.

We responded quickly to the limits imposed by the virus. First we brought in distance learning, then reflected carefully on the meaning of the university in a post-pandemic world, seeking a balance between face-to-face learning and the added value of the digital world. If this balance is well planned, we will be able to attract the best talents and to be competitive with universities at home and abroad, in a landscape boasting a growing number of new higher education players.



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Over the past six years we have increased the number of PhD students by 75% and created 7 new degree courses, of which 4 with partner universities". We have increased European projects awarded in calls by 55%, for a value of €190bn, and attracted 34 ERCs. We have increased patents by about 80%, PoliHub startups from 16 to 120, and Joint Research Centers alongside businesses from 6 to 67...

But I don't want to deluge you with figures and data. You might forgive me for listing our merits. It is a natural temptation at the end of a cycle. But let us stop for a moment, and take a breather.

It is true, the Politecnico di Milano has overcome many limits. It has gone further in the areas of teaching, research, innovation. And so I ask you, on this particular occasion, to stop and reflect on our attempts to find and stabilize these balances.

To overcome limits, we asked our students for ever greater commitment and effort, of this we are aware. Their response has surprised us every day.

I wish to recall here two of their recent successes in **international competitions**: PoliMove, which on the Kennedy Space Center track in Cape Canaveral set the world speed record for a self-driving car, exceeding the limit of 300 kmh. Then the Skyward Experimental Rocketry project, which recently came out top for the "European Rocketry Challenge 2022", beating teams from all over Europe with the launch of experimental sounding rockets.

On the subject of competition, and broken records, let me mention the **sporting merits** of our students at the last Olympics, and especially the Paralympics: the 7 medals won by Simone Barlaam, Giulia Ghiretti, Alberto Amodeo and Manfredi Rizza saw the Italian flag flying high.



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Yes, we like to win! Sport teaches us not to fear rankings, measuring up to others, accepting our weaknesses.

A balance between competition and fragility, to which we must pay the utmost attention.

During the regular Idea League meetings with the rectors of ETH, Chalmers, Aachen and Delft, we have often discussed a delicate issue: the mental health and resilience of youngsters. This issue has been exacerbated by the effects of the pandemic.

We are seeing more and more students in difficulty. Young men and women living moments of uncertainty and weakness as they seek to study and stand out from the crowd. Many are under duress, struggling to maintain a balanced outlook, many far from home or from their loved ones. Unfortunately, these are not isolated cases. They deserve our full attention.

So we created **PolyPSI**, a psychological and therapeutic support service that is now helping more than 1,300 students.

Another major problem is the dropout phenomenon. This is an open wound for the university system. At the Polytechnic, the percentage of *early dropouts* (i.e. students leaving courses in the first year and a half) is still too high: 24% for engineering and 14% for Architecture and Design. To counter this problem, we created our **Data Analytics Unit**. Thanks to advanced statistical systems, we assess the likely risk for our students and implement customised actions to support them.



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In addition to an individual tutoring system, we have multiplied funding for the **right to study**, to be able to accept the ever-increasing number of eligible students, with a demand amounting to €35 million per year.

Is it enough? No, unfortunately.

There remain criticalities in our system, such as that of equal opportunities. A lot has been done thanks to the **POP platform (Equal Opportunities in Polytechnics)**, yet the numbers remain low. We are indeed aware that this battle originates from an enormous cultural problem. The gender issue affects not just women but society as a whole, as well as the ability of our country to compete at an international level.

Only 18% of girls choose **STEM** courses, despite the fact that qualified, skilled personnel with a knowledge of scientific, technical and engineering subjects are in ever growing demand in this technological era. And there are further concerns: Italy has one of the lowest birth rates going. This is bound to lead to a frightening **demographic crisis**. It is estimated that in 2042 there will be at least half a million fewer youngsters than now aged from 18 to 21. Then we have the figure of approximately 3 million **NEETs** in the 15-34 age group, showing up a marked absence of active labour market policies for youngsters.

On the subject of limits and the desire to move boundaries, we can but think of scientific research which, due to its very nature, is the embodiment of the will to go beyond, to aim ever higher. As you know: we have the ambition for the Politecnico to be recognised, in Italy and abroad, as a Research University in the fields of Architecture, Design and Engineering. A "European Leading University", well established in Europe and a leader in **industrial research**.



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In the past few years we have created cutting-edge laboratories, many operating in collaboration with the business world: for example, **POLIfab**, a Microtechnology center, with ST Microelectronics; **robotics** laboratories, with Camozzi; the clean energy laboratory; with the Nhoa Group; the **driving Simulator**, in collaboration with the Lombardy Region; **LABORA**, the architectural modelling lab, inaugurated last year in the presence of the President of the Italian Republic, Sergio Mattarella; the Center on the circular economy and sustainability, with **Eni**. A special mention goes to the **Smart Eyewear Lab** for the design of smart glasses, with Essilor Luott Optica. I should mention here an enlightened entrepreneur who has recently left us: Leonardo Del Vecchio. He will stay with us in our hearts and thoughts.

A Measure of the **PNRR** (Italy's recovery and resilience plan) has resulted in "From research to business", an initiative on which we have worked with the utmost conviction. We are the lead partner of "MOST, the National Center for Sustainable Mobility" and of the partnership for "circular and sustainable Made in Italy". We have also joined partnerships and ecosystems in the fields of energy, artificial intelligence, environmental risks, sustainability of territories, food, telecommunications and sustainable innovation.

But above all, ours is "frontier research", studying the **major transformations of the future**: in space, where we will soon be launching mini-satellites; in biotechnology, where we are working on replicating tumour progressions in the lab; with the 3D printing of vascularized organic material; and in quantum technologies and artificial intelligence.

Faced with these challenges, our research must remain alert to the things going on around us and aware of the related risks. We must not underestimate the ethical and social implications.



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Research needs to examine its limits, the boundaries it cannot and must not exceed, seeking a balance between the needs of the individual, the community and the environment.

For this reason we have: i) created **Meta**, a Humanities and Social Studies Unit on Science and Technology; ii) introduced courses on ethics and philosophy in Master's and PhD degrees in the most at-risk fields of engineering; iii) recruited young philosophers, thanks in part to the Silvio Tronchetti Provera Foundation, within research groups on some particularly sensitive issues, such as self-driving vehicles and biometric devices.

We have further strengthened our social responsibility programme, **Polisocial**, and extended our mission to cater to local needs. Through the Off Campus initiative we have opened spaces in the city for the regeneration of some districts. We have a presence in Nolo and San Siro, and recently in San Vittore prison. Let me say that we were very pleased and proud to receive the the city of Milan's Ambrogino d'Oro award.

No less important is our commitment to sustainability. From the **Ambassador** project to the Environmental Sustainability Report and the SDGs@POLIMI Report, we believe sustainability is not a passing fad, nor just an obligation to be fulfilled. Sustainability is the real keystone for the major transformations taking place. We are talking about CO₂ capture, new energy sources, the circular economy, reusing and recycling materials, making fresh use of waste, and so on.

We are convinced that sustainability is a strategic element for the country's competitiveness, and we are also aware that there is a delicate balance between contrasting forces and divergent needs. A challenge that pits the ecological against the industrial transition, the positioning of a united Europe against local economic interests.



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And that is why, alongside the digital and green transitions, I would add the industrial transition, which includes the re-training of the workforce and responsible technological innovation for the growth of our territories and our products. Only in this way can we strengthen the country's identity within Europe. The continent's identity must also be forged by its efforts in the area of sustainability.

The future of the planet, of new generations and of our businesses depends on the fine balance that is established between higher education, scientific research, technological development, social responsibility and sustainability.

The role of universities in this evolution is crucial, and should not be underestimated. The university system should act as a guiding light that shows the way, with courage and openness.

I now address my fellow Rectors, the friends who have shared my Presidency of the CRUI, and the new University and Research Minister. The pandemic has given way to a recovery plan, with unprecedented reforms and resources. This is an opportunity we cannot afford to miss.

We have worked closely with Minister Messa and with Ministry officials. I would like to thank them personally and on behalf of the Politecnico for implementing PNRR measures: in one year we have gone from announcing the first calls to assessments, recruiting and initial investments.

We have attempted to bring the university to the centre of the country's policies. We have had meetings with the Government, and our proposals have gone far beyond the Ministry of Universities and Research, which was once our only point of contact. We have had discussions with many ministries - Justice, Economics and Finance, Economic development, Ecological Transition - and



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shared projects. And today, we are asking the newly elected Government for a new alliance for the university, for research, for Made in Italy, for nurturing talent.

Dear colleagues, at this moment I am talking to you directly: the university must do even more. Right now, thanks to the resources we have at our disposal. A first appeal concerns the implementation of the PNRR, which must be both rapid and effective.

If we see how the Ordinary Fund is distributed (based on the number of students) and the results of Research Quality Evaluations (based on the number of lecturers), we cannot help but emphasize how some criteria are still based on quantitative rather than qualitative assessments. The correlation is too high.

We are still a long way from implementing actual "reward" policies; this is something that concerns not only universities, but the whole country.

We often wonder whether we should **"Give excellence free rein"** or rather **"reduce the gaps"**? As if they went in alternative directions. I believe we should enhance differences so as not to dull the system. In other words, we must have the courage to strike an uneasy balance between realities that operate at an international level and others that fulfil an equally important task, serving local territories.

On the one hand, the Ministry must pursue specific policies: measures to overcome the limits imposed by red tape, allowing Italy to compete in Europe and the world; and measures in support of those who work, not without difficulty, in places where education remains the only social elevator. It is therefore necessary to have different measures for different goals.



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On the other hand, we must have the courage to recognize that there are differences: between universities focusing on research and universities investing in training; universities open to international dialogue on major scientific challenges and universities called upon to meet the needs of local economies and develop territories. If we fail to govern the system, a natural equilibrium will be formed, in a place we may not like.

We can see this in data on degree student and PhD student numbers over the past ten years... and I remind you that the graph does not show online universities, which have been growing strongly. In other words, we must encourage universities to find their own vocation, their own distinctive trait, in order to differentiate the "offer" of the university system.

Like all Italian universities, therefore, our Politecnico must follow its vocation, its vision and the mission it has to complete. We have put this down in black and white in our latest Strategic Plan. Without going back to our list of achievements, I would like to draw attention to what we have failed to achieve. The limits we have not been able to overcome. **Systemic limits.**

Let me start with internationalization, a drive that has enabled us to strengthen relations in Europe and raise the number of foreign students and international lecturers. On the other hand, we have failed to launch a Campus of Italian universities in **Africa**. It was and continues to be our goal with the Italian High Education Africa Foundation, working alongside other universities - Rome Sapienza, Bologna, Florence, Naples Federico II and Padua. **We have not succeeded because of the lack of structured positioning on the African continent. We need a systemic approach on the part of Italy as a whole, on a par with that adopted by other countries.**

Although we have not neglected our vocation towards business, and have paved the way to the first **venture capital fund**, Polimi360, as well as the most



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recent Tech4Planet, working with Cassa Depositi e Prestiti, we have not managed to undertake a European initiative. Teggwings, the fund created with ETH, Aachen and Delft, failed to take off. **We continue to believe that our country and Europe must develop a shared policy on technological innovation and business creation. Only in this way can we compete with US, Chinese, Israeli and Japanese rivals. Initiatives must have a critical mass and a financial mass, with an international vision.**

Finally, our natural propensity towards architecture and the **quality of spaces** has led us to undertake major building investments. You can see them in the images behind me: the students' Hill, the Bonardi Campus, Leonardo's Garden, sports facilities... just to mention a few. We have opened and completed dozens of construction sites, notwithstanding the pandemic, but we still have many concerns. The number one concern is that of accommodation. The Politecnico currently has seven residence halls in Milan, housing about 2,000 students, Faced by the “dear rents” problem, they are a drop in the ocean. **The national university system is about to receive over 1 billion euro for investments in residence halls in response to the "Law 338 Call". This law has been poorly funded up to now. We need strong government action to address what is now a real priority.**

We have been on a long journey over these last six years, working in a trial and error manner. We have learned lessons. We have realized that we cannot sit back and relax. We are not at the finishing line. We have missed goals, but we have never deviated from the path.

Whoever takes over after me will I am sure carry on the vision of a first-rate public institution: that of being a modern, international campus, open to new functions and sustainable; a university that is a source of pride for the city of Milan and for its community. At this



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point I would like to offer my most sincere congratulations and best wishes to the new Rector of Politecnico di Milano, Prof. Donatella Sciuto.

A vision that we have begun to see turn into something concrete with the **Bovisa Campus** project. First by recovering the iconic architecture of the **Gasometers**, with new spaces dedicated to technological innovation and sport, with an investment of over 100 million euro, work on which will start in the summer.

Then we have in the pipeline a second **expansion** of 80,000 square meters (as we presented last week). Thanks to the ION Foundation we have been given the Alumnus Renzo Piano project, which is now passing onto the implementation of the **protocol** agreement signed with the Ministry of Infrastructure, Ministry of Universities, Lombardy Region, Municipality of Milan, FNM and Rete Ferroviaria Italiana.

It is a project covering a total area of over 320,000 square meters, including 24 hectares of **regenerated** urban woodland and the Politecnico Campus, plotting a new way of “university life” with multiple functions. Here there will be residence halls, areas for study and smart work, an area dedicated to **startups**, in line with the latest international standards connecting the university and business worlds: 30,000 square metres set aside for deep tech innovation and the challenges of digitization and sustainability. The result will be a digital campus, carbon-neutral, accessible, open to the city and to the exchange of ideas and functions. I would like to let you hear an excerpt from Renzo Piano's presentation...

Let me leave you with the image of a space that has all the potential to fire Milan into the panorama of major European initiatives in the areas of innovation and new entrepreneurship.



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Let us cast an eye to the future, in the certainty that Politecnico di Milano, with its wealth of people and talent, will overcome new limits, find new balances, seek new horizons. Thank you for listening.

Many thanks to everyone.