



**ATHENA**  
EUROPEAN UNIVERSITY



**ATHENA**

Advanced Technology Higher Education Network Alliance

# The Vision of ATHENA Research-based Cooperation

// Views of Alliance Members / From ARB2

A Compendium of Contributions  
of the **ATHENA Research Board Members**

Curated by WP4 team  
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# **The Vision of ATHENA Research-based Cooperation: Views of Alliance Members**

**A Compendium of Contributions  
of the ATHENA Research Board Members**

**From the ATHENA Research Book Volume 2 (ARB2)**

Curated by WP4 Team:

József Györkös, *ARB2 co-editor*  
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September, 2023



# Introduction

For the second volume of the ATHENA Research Book, the members of the ATHENA Research Board have been asked to contribute a presentation of the research landscape of their institution, including the notions on the vision of research-based cooperation within the ATHENA alliance.

The content of this compendium is made of excerpts from individual contributions of the research board members with the purpose of serving as a comprehensive discussion material on different occasions, not limited to:

- (a) ATHENA Research Board working material and informative material for other boards and decision-making bodies
- (b) Discussion material for use at the ATHENA Alliance 7th Management Meeting Siegen
- (c) Background material when applying for various funding schemes.

Indeed, for a full understanding and conceptual placement of these excerpts, readers are invited to refer to the first chapter of the ATHENA Research Book, Volume 2, published in open access [<https://press.um.si/index.php/ump/catalog/book/812>, DOI: <https://doi.org/10.18690/um.4.2023>].

*Technically, only a few editorial changes have been made to this Compendium. References to the literature have been removed, and in one case, numbers have been deleted, which is clearly marked as an editorial comment.*

József Györkös

*ATHENA Research Book co-editor and ATHENA Research Board co-ordinator*

Tatjana Welzer

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# The Vision of ATHENA Research-based Cooperation by the Hellenic Mediterranean University (HMU)

**Michael Tatarakis** (chair of the ATHENA Research Board)

The research mission of ATHENA University is as important as the educational mission and consists in the systematic support and promotion of scientific research.

The research policy document of the ATHENA University is under development and defines the mission and priorities of the University and its alliances. The policy focuses on innovative, including interdisciplinary, research aiming at creating immediate, medium and long-term benefits to the students as well as the European society, economy and humanity in general. The policy is focused on creating a culture of quality and excellence based on cooperation and a synergetic academic environment. In this spirit, it was launched by the author of this article at the 1st ATHENA research board meeting in Orleans on 28th February 2022, the idea of establishing common research infrastructures within the ATHENA University. The “Challenges of a step-by-step Research Integration” manifesto was presented and analysed by the author, and discussed within the board. The advantages are presented below:

- Will strengthen the ATHENA university entity in EU and national authorities,
- Such action is in line with the EU policy for the European higher education era, including research integration,
- Is rather the most efficient path for ATHENA to be developed as an entity of excellence in research and education,
- Will reinforce the efforts to attract research funds within the present competitive environment,
- Is the appropriate way to elaborate the new knowledge into the education curricula of ATHENA university.

The benefits of the creation of common research infrastructures giving research access to ATHENA partners are summarized: (a) Reduce breaking up of the research and innovation ecosystem of ATHENA University and avoids duplication of expenses and efforts, (b) Launch policies for the ATHENA, offering well-established inter-institutional or Research Infrastructures or to develop strong bonds with national RIs, (c) Join forces to construct and run large, complex or expensive infrastructures, respond to global challenges and/or foster combining skills, data and efforts of the world's best scientists, (d) Foster the innovation potential of Research Infrastructures by making industry more aware of opportunities offered to improve their products and by the co-development of advanced technologies, (e) Need for personnel costs covered partially by the EC.



Such integrated research infrastructures will strengthen the creation of ATHENA Doctorate School and the establishment of joint doctoral programs. Furthermore, the action will support activities building a strong research osmosis between the partner Institutions.

The aforementioned actions are being implemented and developed by the WP4 working group supported by the ATHENA research board.

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# The Vision of ATHENA Research-based Cooperation by the Maria Curie-Skłodowska University (UMCS)

**Wiesław I. Gruszecki** (member of the ATHENA Research Board), **Diana Szczepańska**

Active in a wide range of disciplines, involving the arts and humanities, social sciences, as well as formal and natural sciences, Maria Curie-Skłodowska University is a unique institution within the ATHENA network. This gives the network an opportunity to apply for inter- and multidisciplinary projects focusing on societal aspects.

The ATHENA research priorities such as Artificial Intelligence, Information & Communication Technologies, Digital Society & Digital Arts, Health & Food Technologies are strongly connected to the expertise of researchers at UMCS and the priority research areas of the University and the Lublin Region. Cooperation with research centres and institutes in terms of joint research projects implementation, infrastructure sharing and R&D activities will be supported by our International Cooperation Centre.

The cooperation in cosmetic science could be another strategic cooperation priority with researchers at UMCS. At the Institute of Chemical Sciences there is a research group very actively cooperating internationally within cosmetology. The cooperation can involve both education (joint summer schools, BIPs) and research (projects, sharing facilities). Another priority is photonics, particularly in view of the well-developed high-tech infrastructure at UMCS. LOFT (Optical Fibre Technology Laboratory) UMCS is internationally recognized for its applied research in the field of optical fibres technology and is also uniquely involved in industry innovation projects in Poland and Europe. LOFT UMCS has more than 40 years of experience in implementing technology innovation projects.

# The Vision of ATHENA Research-based Cooperation by the Niccolò Cusano University (NCU)

**Armando Piccardi** (member of the ATHENA Research Board)

Research at UniCusano is an established reality that is still growing fast, due to the synergistic effect of the formation of researchers, the collaboration with the production realities, and the effort to match between the two parts. In the framework of continuing to play a major role in the Italian research landscape and over, ATHENA represents a natural and perfect opportunity to create other links towards other European subjects.

What ATHENA can bring to UniCusano is a solid network of advanced research partners with whom to interact, a research infrastructure which can sustain its activities, and a way to enlarge its competencies.

What Unicusano can bring to ATHENA is its model of an institution working in close connection with companies and industries, its established experience in advanced technology-driven education which can favour the formation and the mobility of researchers at all levels promoting the development of remote and/or shared research models, and the enthusiasm of a young institution which is growing due to its ability to fully recognize the need of its reference market.

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# The Vision of ATHENA Research-based Cooperation by the Polytechnic University of Porto (IPP)

**Cristina Matos, Carlos Ramos, Paula Escudeiro** (member of the ATHENA Research Board), **Nuno Escudeiro**

ATHENA seeks to create a dynamic alliance that transcends boundaries, leveraging the collective expertise and resources of its members to address global challenges and drive impactful research outcomes. This proposal outlines the strategic message and contribution of ATHENA to the idea of an alliance.

1. **Vision Statement:** The vision of ATHENA is to establish a global alliance of research-intensive universities committed to advancing knowledge, driving innovation, and addressing societal challenges through collaborative research endeavours. By promoting cross-institutional collaboration, ATHENA aims to create a vibrant ecosystem where ideas, talent, and resources converge to generate transformative solutions that positively impact our world.
2. **Strategic Message:** ATHENA's strategic message revolves around four key pillars that underpin the alliance's mission and goals:
  - a. Excellence in Research
  - b. Global Engagement
  - c. Knowledge Transfer and Innovation
  - d. Talent Development and Education
1. **Contribution to the Idea of Alliance:** ATHENA's proposed research-based cooperation brings significant contributions to the broader idea of alliances by:
  - a. Amplifying Research Impact.
  - b. Fostering Collaborative Innovation
  - c. Facilitating Global Networks
  - d. Empowering Future Leaders.

In summary, the vision of ATHENA as a research-based cooperation is to establish a global alliance that promotes excellence in research, global engagement, knowledge transfer and innovation, and talent development and education. By focusing on these pillars, ATHENA aims to amplify research impact, foster collaborative innovation, facilitate global networks, and empower future leaders.

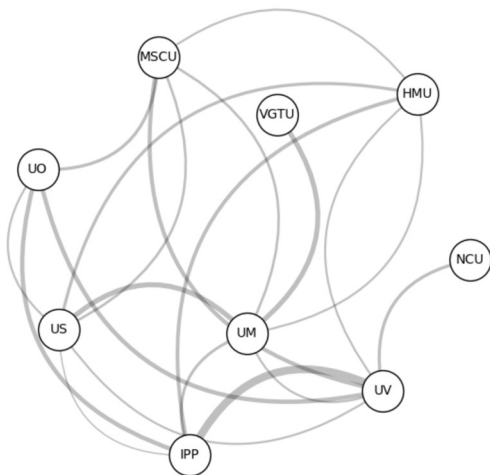
Through strategic partnerships, joint research projects, knowledge exchange programs, and collaborative initiatives, ATHENA will create a vibrant ecosystem where ideas flourish, research thrives, and impactful solutions are generated. By leveraging the collective strengths and resources of its member institutions, ATHENA will contribute to the advancement of knowledge, the development of innovative solutions, and the transformation of society.

# The Vision of ATHENA Research-based Cooperation by the University of Maribor (UM)

Dean Korošak (member of the ATHENA Research Board)

The analysis presented in the previous section and its extension to all pairs of ATHENA universities alliance could inform the alliance on potential opportunities in fostering further mutual research cooperation. Here, to get a first look at the structure of ATHENA research space we constructed two graphs showing links between pairs of ATHENA members: a co-publication graph where two universities are linked if they share joint publications, and a cooperation graph where two universities are linked if they share institutions in their research collaboration. Such an analysis of research data helps us to start to understand the strengths and opportunities of ATHENA research space.

Figure 1 shows the co-publication graph of ATHENA. The links connect pairs of universities that share publications. The structure of the network might tell us something about the current state of ATHENA research collaboration.

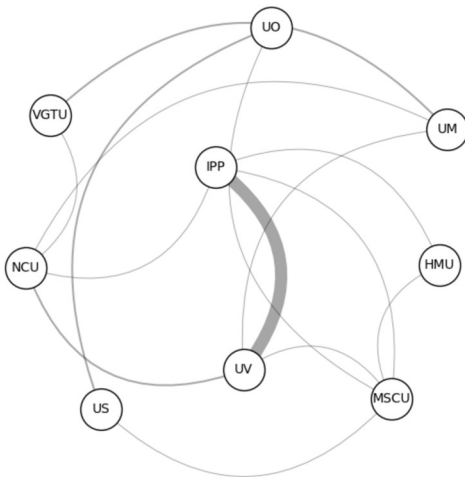


**Figure 1:** ATHENA university alliance co-publication graph (data from WOS [9]). The thickness of edges between the nodes (universities) indicates the strength of research cooperation as detected from number of joint publications.

Looking at the number of links per node or the degree of the node we notice that NCU and VGTU are connected only to one partner, while other ATHENA members share more links. We also computed the betweenness centrality of each node and explore the triads in the network or 3-node motifs. UV and UM emerge as central figures, with high betweenness centrality values (0.28, 0.29), suggesting they frequently serve as bridges in the shortest path between other universities. This is reinforced by their frequent appearance in various triadic

3-node motifs (12 and 10 out of 21), indicating their participation in numerous triadic collaborations. US, while having a moderate betweenness centrality, is also a common element in many 3-node motifs, suggesting its significant role in multi-institution collaborations. The presence of HMU (9) and UO (5) in a good number of triadic collaborations also shows their integral role in the network despite their lower betweenness centrality. NCU and VGTU, with their betweenness centrality of 0, do not appear in any of the 3-node motifs. This highlights their peripheral role in the network and suggests potential opportunities for them to increase their involvement in multi-university collaborations.

To construct a cooperation graph, we mapped ATHENA Research Priorities into the following WOS science categories: Green & Sustainable Science & Technology; Engineering, Manufacturing; Computer Science, Artificial Intelligence; Food Science & Technology; Computer Science, Information Systems; Health Care Sciences & Services; Art. We then gathered lists of research partners that collaborated on publications for each ATHENA university in all these science categories. From intersections of the lists of research partners (top most frequent 30 institutions) we finally obtained the cooperation graph shown in Figure 2. In this graph, two nodes are linked in they share common research partners. So, research partners of alliance members serve as coupling elements between them and indicate towards potential new collaborative research opportunities.



**Figure 2:** Graph of ATHENA alliance from overlap of top 30 partnering institutions for each pair of members (for example, this corresponds to top 3 % of all research partners of UM)

Here, in contrast with publication collaboration graph, MSCU and UV serve as important bridges in the network with highest betweenness centrality. Both institutions are also most frequent in 3-node graph motifs (3 out of 6).

With this couple of examples of research landscape analysis we tried to quickly illustrate how the strengths, opportunities and challenges for research collaboration with ATHENA and wider can be explored using bibliographic data. The development of the methodology to follow and analyze research output of ATHENA alliance and in particular detect missing links that can strengthen the alliance can in our view be one of the important future tasks of the ATHENA Research Board.

# The Vision of ATHENA Research-based Cooperation by the University of Orléans (UORL)

**Ioan Todinca, Pascal Bonnet** (member of the ATHENA Research Board)

For the first phase of ATHENA, we focused on identifying partnerships, through visiting programs for researchers, joint conferences and meetings, and collaborative projects in informatics, automation and signal processing, materials sciences, linguistics. We have been greatly helped financially for these actions by the support of the French research agency (ANR) dedicated to European universities.

Research projects already structured on the scale of Orléans and our Region, such as MatEx, CosmétoSciences and Junon have invested in the organization of conferences specially dedicated to the creation of an ATHENA network in the respective fields. We relied heavily for all this animation on Le Studium, (regional) Institute for Advanced Studies.

For the second phase of our European alliance, we intend to build on these contacts to refine the strategy of exchanges and joint events, to share the use of large equipment, to propose more extensive collaborative projects, with a leverage effect to acquire European and national funds.

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# The Vision of ATHENA Research-based Cooperation by the University of Siegen (USIEGEN)

**Thomas Mannel** (member of the ATHENA Research Board)

Our society is experiencing sudden changes in the way people and institutions produce and manage value. These changes are in part due to the growing ease with which people can collaborate nowadays. Many successful cases of peer-to-peer models of organization arise and assume leading positions in world economy. People are evolving and interacting inside heterogeneous teams composed by members from many different cultural groups and with distinct skills and backgrounds.

Modern economy and society being highly dependent on technology requires complex problem solving and communication skills in technical subjects. In such a demanding and culturally diverse environment as the professional world is today, it is essential to promote the development of team-work and communication skills at an international and intercultural level.

Presently, there is an increasing need for the establishment of international and multidisciplinary teams. These teams, either spontaneously or explicitly generated, are capable of conceiving and developing successful products to be distributed worldwide. Therefore, we consider being of extreme importance to start promoting this type of work as early as possible – even in students’ academic activities. Leading future engineers at an early stage of their higher education to be involved in an academic multinational project where they will need to interact and communicate at distance with their team and work together to fulfil a common target, will certainly be challenging and enriching both for students and teachers as well as researchers involved. Furthermore, it will provide all with the communication and cooperation skills essential to survive in the international world market.

An alliance of different Universities as the European University ATHENA provides an ideal platform for students, teachers and researchers to cooperate in education as well as in research projects, that generate relevant outputs to the community.

The starting point for establishing the core group of ATHENA has been the *Multinational Undergraduate Team Work* project (MUTW), in which students from different countries have been collaborating in small research projects. This activity has now been successfully continued since more than 10 years.

The cooperation of these Universities has been continued by several Erasmus plus research projects establishing an innovative infrastructure to promote the communication between deaf and non-deaf as well as among international deaf students.

The expansion of the core group with three additional universities created the ATHENA Alliance. The mission of ATHENA is to become a global hub for excellence and inclusion, intensifying high-end knowledge production, radically improving access and sharing results in more innovative ways.



# The Vision of ATHENA Research-based Cooperation by the University of Vigo (UVIGO)

**Rubio, B., Del Pozo** (Member of the ATHENA Research Board), **M., Reigosa, M. J.**

UVigo's entry into the ATHENA alliance will facilitate synergies for new research and transfer projects, thereby promoting quality and impact research. This will contribute to creating a network of research infrastructures and teams, to increase competitiveness of project proposals and fundraising, thus boosting socio-economic development and reciprocally facilitating infrastructures and resources from UVigo, Galicia and the Galicia-North Portugal Euroregion to ATHENA partners.

Teaching and research staff, as well as technical and administrative staff, will avail of training opportunities within a European cooperation environment. From the point of view of educational offer, ATHENA will also promote internationalisation of UVigo's bachelor and master's degrees, and doctoral programmes. At the industrial and social level, the ATHENA membership will provide benefits in relation to the transfer of results, training of professionals for excellence, better European level job prospects and for fostering exchange between universities, industry and society.

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# The Vision of ATHENA Research-based Cooperation by the Vilnius Gediminas Technical University (VGTU)

**Dalius Navakauskas** (member of the ATHENA Research Board)

Trends in Europe and around the world, such as rapid technological development, digital transformation, the Green Deal, and the Industrial Revolution, are prompting universities to change. Global challenges – including climate change, economic instability, pandemics – pose threats, yet they also provide unique opportunity to pursue cutting-edge technological solutions, motivating swift and effective responses as well as long-term thinking.

VILNIUS TECH is prepared to face these challenges and changes. By building on the values of our community – sustainability, connectedness, creativity, openness, and innovation – we leverage our strengths.

# **The Vision of ATHENA Research-based Cooperation by the Carinthia University of Applied Sciences (CUAS)**

**Peter Granig, Claudia Pacher, Tina Paril**

As an institution, Carinthia University of Applied Sciences (CUAS) is always eager to further its research and teaching excellence, as well as to increase its visibility and involvement on the European level.

CUAS sees itself as an integral part of the network in the area of R&D, and thus strives to increase its participation in the European Research Area through the Alliance. CUAS is willing to share its expertise, research laboratories and equipment with the ATHENA universities and is ready to learn from them in return. CUAS vision of research is that cooperation between people from different backgrounds, be it in disciplines, focuses or cultures, allows for richer and more fruitful results. Hence, the research-based cooperation between ATHENA and CUAS will enrich our institutions' fields of research, while also offering our researchers opportunities to gain experiences within ATHENA.





Hellenic Mediterranean University  
Maria Curie-Skłodowska University  
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Polytechnic Institute of Porto  
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University of Vigo  
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Carinthia University of Applied Sciences

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