DOI: 10.5185/amlett.2024.011738

OPEN ACCESS

EDITORIAL

Celebrating 15th Anniversary of Advancement of Materials to Sustainable and Green World

Ashutosh Tiwari*

Institute of Advanced Materials, IAAM, Gammalkilsvägen 18, Ulrika 590 53, Sweden

***Corresponding author**
E-mail: director@iaam.se
Tel.: (+46) 1313-2424

ABSTRACT

The article commemorates the 15th anniversary of the International Association of Advanced Materials (IAAM), highlighting its pivotal role in advancing materials science, engineering, and technology. It outlines IAAM's journey towards integrating with the United Nations' Sustainable Development Goals, European Green Deal and its leadership in establishing Net-Zero Research and Development World Links. The focus is on IAAM's vision, mission, organizational structure, and the diverse memberships that contribute to its global excellence. The article explores the significant contributions of IAAM members and fellows, emphasizing their role in propelling advancements in materials science and technology. Further, it discusses IAAM's critical function in promoting research and education, detailing its involvement in various institutes, events, consortiums, and the recognition it extends through prestigious awards. The article also showcases IAAM's impressive publication portfolio, reflecting its commitment to knowledge dissemination. As IAAM celebrates this milestone, the article reviews its historical activities and achievements, underlining its impact on shaping a sustainable and green future in the field of advanced materials.

KEYWORDS

IAAM, SDGs, Net-Zero R&D, World Research Links and Advanced Materials Community.

ADVANCEMENT OF MATERIALS TO GLOBAL EXCELLENCE

The International Association of Advanced Materials' (IAAM) annual book, unveiled by the Secretary General, commemorates the 15th anniversary since IAAM's inception on January 20, 2010 [**1**]. It encapsulates a journey of over a decade, detailing IAAM's key activities, achievements, and future goals. Adhering to the motto **'Advancement of Materials to Global Excellence'**, IAAM focuses on emerging fields like health, energy, electronics, and climate materials, emphasizing circular innovations and organic research for practical applications [**2**]. IAAM councils, representing diverse groups including youth, academia, women, business, and social sectors, reflect the consortium's essence and community spirit [**3**].

The journey towards a climate-neutral future is emphasized, acknowledging the challenges, especially in developing nations, and underscoring the importance of global solidarity and climate diplomacy. IAAM's alignment with the United Nations' Sustainable Development Goals (SDGs) underlines its commitment to a sustainable future, contributing significantly across various SDGs [**4**]. IAAM's pioneering role in Net-Zero R&D World Links is highlighted, focusing on developing sustainable materials and technologies for net-zero emissions.

The article elaborates on IAAM's vision of leading in sustainable and green technology advancements, its mission of fostering collaboration and excellence in materials science, and its structured organization designed for global collaboration. IAAM's activities in empowering materials research for next-generation technologies aim at creating a 'Climate Neutral Society' [**5**]. The United Nations' accreditation of IAAM's climate activities aligns with the European Green Deals, aiming for Europe's carbon neutrality by 2050 [**5-7**]. The 2030 IAAM Agenda for "Advancement of Materials to a Sustainable and Green World" underscores policy and governance robustness for a green transition to a global circular economy [**8**].

Moreover, the article explores IAAM's global excellence in materials advancement, highlighting its diverse and influential membership and the exceptional contributions of IAAM Fellows. IAAM's diverse membership, spanning continents, includes researchers, institutions, and industry

leaders united in the mission of advancing sustainable materials. IAAM Fellows, recognized for significant contributions to materials science, are celebrated for their role in shaping the future of research and development in the field.

The IAAM was founded as a non-profit organization, with the aim for the promotion of advanced materials to global excellence [**9**]. The organization works to create a highly interactive international network of researchers, students, and representatives from academia, industries, policymakers, governance and civil society working in the interdisciplinary fields of advanced materials science, engineering, and technology.

As the technological era has emerged, all sectors and industries have been undergoing a massive evolution with the inception of more efficient and smarter ways to carry out activities. Advanced Materials have been at the heart of all these developments. In over the decade, experts all over the world have realized the value of advanced materials and thus, the process of developing advanced materials has become extremely popular. IAAM was born out of a similar attempt to enhance and improve the field of advanced materials. Since its establishment, the association has come a long way, overcoming all the challenges and hurdles, to create a rich legacy of the global network that works to facilitate the Advancement of Materials to Global Excellence as shown in the IAAM's circle infographics (**Fig. 1**). IAAM has created one of the largest global networks for the advanced materials community [**1,10**]. As the association completes fifteen years of existence, we look at the remarkable journey that it has undertaken and how various institutes, industries, members, and delegates have contributed to making the IAAM the prestigious organization it is today.

IAAM interdisciplinary activities provide one of the leading platforms in the world for delegates and members to indulge in global networking. The organization, over these fifteen years, has built the largest community of advanced materials researchers and associated organizations in the field.

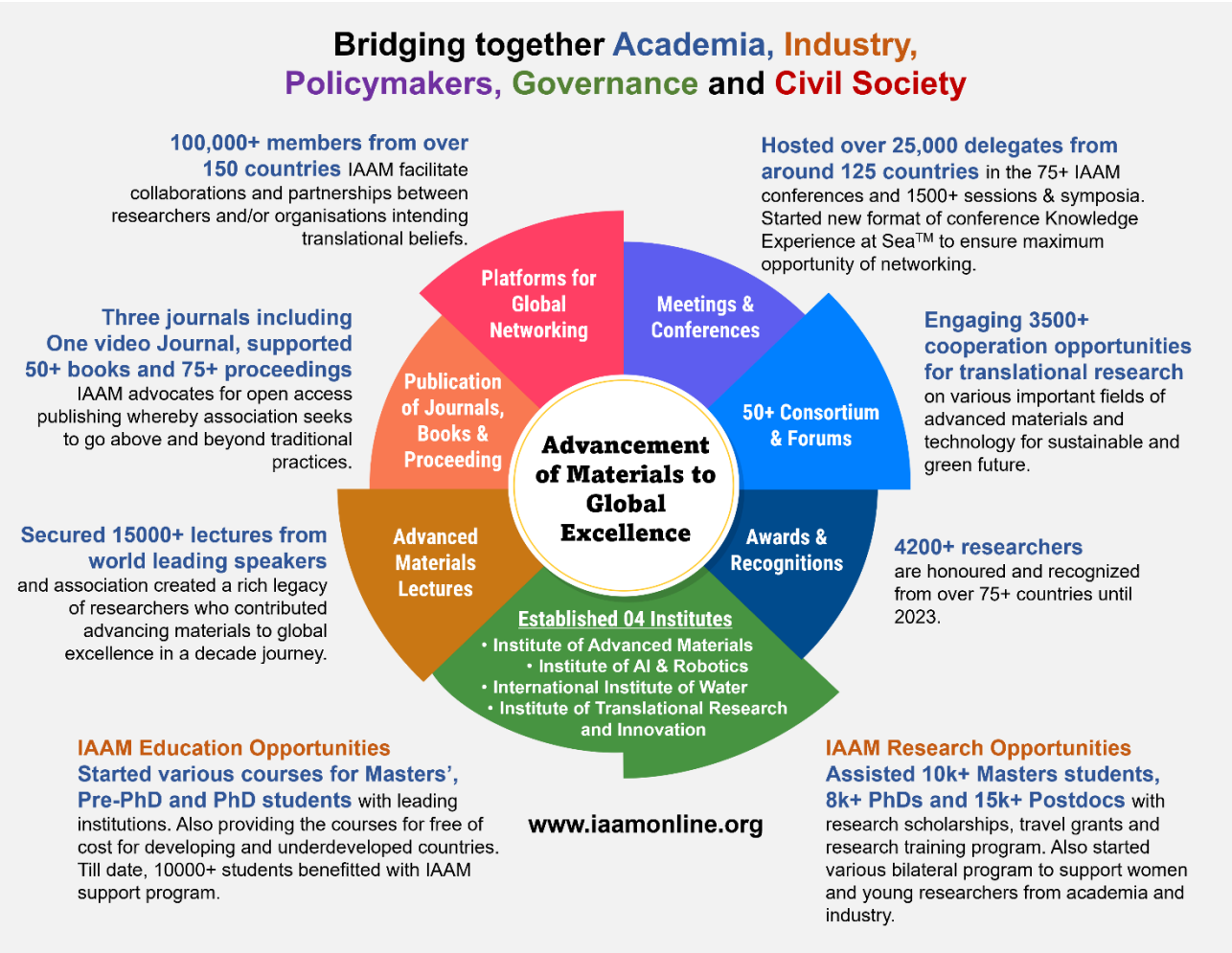

Fig. 1. International Association of Advanced Materials enhance the field of advanced materials for global excellence. A rich legacy of the global network that works to facilitate the Global Excellence are reprented by forums, publication platforms, global congress, awards and educational trainings with global presence.

FIFTEENTH ANNIVERSARY OF ADVANCING MATERIALS

In the age of green technology, advanced materials have played a pivotal role in transforming industries and processes. Over the past decade, the International Association of Advanced Materials has emerged as a key player in advancing these materials. IAAM has strived to enhance the field of advanced materials, culminating in a global network committed to achieving excellence. As IAAM marks its fifteen anniversary, this article reflects on its journey, emphasizing its focus on health, energy, electronics, and climate materials. IAAM's alignment with the UN's Sustainable Development Goals, emphasis on Net-Zero R&D, and vision of a sustainable, green world underscore its commitment to a climate-neutral future [**4,5,11**]. The article explores IAAM's global leadership in materials advancement, its diverse membership, and the contributions of IAAM Fellows in shaping the field's future.

IAAM's worldwide leadership in advancing materials, its diverse membership, and the influential role of IAAM Fellows in shaping the field's future are depicted in IAAM's circle infographics (**Fig. 1**) [**12,13**]. As the association marks a decade of existence, we reflect on its remarkable journey and the collective contributions of institutes, industries, members, and delegates [**14-16**]. These contributions have elevated IAAM to its current prestigious status.

R&D World Links

IAAM's global R&D decentralized initiatives operate on the principle that collaborations foster translational innovation, particularly in advancing new methods and technologies for materials sustainability, health, energy, and the environment [**17**]. The Institute of Advanced Materials has created a network of R&D labs and decentralized facilities to bolster and enable interdisciplinary engagement among worldwide researchers and scientists in Translational Research & Innovation [**18**]. The institute orchestrates projects and unites experts across various disciplines.

IAAM conducts research, innovation, and educational programs through its R&D World Links and four institutions: the Institute of Advanced Materials, Institute of AI and Robotics, Institute of Translational Research & Innovation and International Institute of Water (**Fig. 2** and **Fig. 3**) [**14-16,18,19**].

Institute of Advanced Materials

The Institute of Advanced Materials (PIC: 891021534, Website: www.iaam.se) was established in 2015 through collaborative efforts with the International Association of Advanced Materials [**14,18,19**]. Since its inception, the institute has been dedicated to empowering industries and startups by bridging the gap between research and innovation. We provide specialized services focused on advanced R&D, innovations, and cutting-edge technologies with a strong commitment to achieving net-zero emissions.

As an organization, we are driven to push the boundaries of technology and innovation, striving to make a positive impact on sectors vital to humanity's well-being. The Institute of Advanced Materials actively promotes translational research and innovation in areas such as health, energy, environment, and more. We offer top-tier consultancy services in R&D, technology transfer, and infrastructure development, ensuring that high-quality research is transformed into practical and meaningful products for end-users.

Fig. 2. The remarkable contributions of IAAM's institutes along with decentralized facilities enable interdisciplinary engagement among worldwide researchers. These IAAM's global initiatives operate on the principle of materials sustainability for health, energy, and the environment.

Our institute maintains a global presence in materials science, engineering, and technology by fostering robust partnerships and collaborations with renowned researchers, institutions, and scientists from over 125 countries [**19-21**]. We take into account consumer demand and focus on designing, innovating, and optimizing materials across a wide spectrum of disciplines, including physics, chemistry, biology, medicine, engineering, biotechnology, data science, mathematical modeling, nanoscience, and nanotechnology. The overarching goal of the institute is to advance translational research and innovation for the betterment of society, actively contributing to the welfare of communities worldwide.

Institute of AI and Robotics

Artificial Intelligence has ushered in remarkable advancements in the field of healthcare. Institute of AI and Robotics was established through collaborative efforts with the International Association of Advanced Materials and focused on Artificial Intelligence advancements and enhanced field of robotics [**16**]. The integration of Artificial Intelligence with other intelligent technologies has led to increased efficiency and feasibility in healthcare facilities and processes. This convergence has given rise to clinical and other applications that deliver highly effective care and facilitate insightful operations. Thanks to Artificial Intelligence, the time required for healthcare service delivery can be significantly reduced, leading to enhanced efficiency.

The Institute offers its expertise in technological innovation within the realm of AI-enabled smart technologies. The organization hosts a consortium dedicated to addressing the current challenges in this domain [**22**]. Leveraging our network of experts and our extensive experience in the healthcare industry, we contribute ideas to advance the field of robotics. With the emergence of smart wearable devices and virtual healthcare facilities, AI-enabled Smart Healthcare is experiencing significant growth.

International Institute of Water

The International Institute of Water (IIW) leads the way in advancing global water expertise in accordance with the United Nations' initiatives (**Fig. 3**) [**15**]. The Institute, nestled in the culturally vibrant city of Jodhpur, Rajasthan, stands as a distinguished and revered institution dedicated to tackling the urgent global water crisis. Our institute is deeply committed to advancing knowledge, advocating sustainable water management practices, and fostering international collaboration in the realm of water resources. IIW operates under a singular and unwavering mission: to ensure the sustainable and equitable stewardship of water resources, benefiting both current and future generations [**23**]. Our institution serves as a beacon of innovation and research excellence, providing fertile ground for the personal and professional growth of our dedicated team members.

Fig. 3. IAAM conducts research, innovation, and educational programs through its R&D World Links and three institutions: the Institute of Advanced Materials, Institute of AI and Robotics and International Institute of Water.

Strategically located, IIW provides an ideal setting for researchers and students specializing in the intricate domains of water management and rural development. Our educational and research landscape spans a wide spectrum of critical areas, including water resource management, climate change adaptation, rainwater harvesting, and water quality enhancement. At IIW, we recognize the immense value of this dynamic environment, where theory meets practical application, and where research becomes a catalyst for positive change in the realm of water management and rural development. Through unwavering dedication to these guiding principles, IIW aspires to make a profound and lasting contribution towards realizing a water-secure world. In this vision, the invaluable resource of water is not merely safeguarded but also shared judiciously, ensuring that it benefits all of humanity, both now and in the future.

Institute of Translational Research & Innovation

The Institute of Translational Research & Innovation is a cutting-edge institution dedicated to bridging the gap between scientific research and real-world applications. It focuses on translating scientific discoveries into innovative solutions that can be implemented in various fields such as energy, materials, health, green technology, and climate neural solutions. The Institute emphasizes collaboration among scientists, engineers, and industry professionals to foster an environment of interdisciplinary research and development. Its mission is to accelerate the journey from laboratory research to market-ready products, services, and technologies, thereby contributing to societal progress and global innovation. The Institute also prioritizes education and training for the next generation of researchers and innovators.

Events and Consortium

The Advanced Materials Congress, Baltic Conference Series, Fellow Summit, International Conclaves, and World Conference Series are the premier international IAAM's events that bring together academia, industry, policymakers, governance and civil society to discuss their experiences, cutting-edge findings, and collaborative research across disciplines organising in the major continents, including America, Asia, Europe, and Australia [**1,24,25**]. IAAM's events and conferences, organized under the unique theme such as 'Knowledge Experience at Sea or at Campus or at Nature or at Web,' serve as an international stage for the widespread dissemination and assessment of cutting-edge research in advanced materials science [**26**]. These gatherings bring together researchers from diverse scientific backgrounds and industry professionals on a single platform, embarking on a journey of knowledge exchange and networking. Participants, spanning various age groups, collaborate, share insights, and contribute significantly to IAAM's mission of 'Advancement of Materials to Global Excellence.' Through its numerous events and conferences, IAAM caters to the entire advanced materials community, providing forums and platforms that facilitate global networking and foster partnerships.

In its about fifteen years of existence, the Advanced Materials Congress (AMC) has actively established a global platform spanning Europe, Asia, Australia, and America to collectively pursue the 2030 agenda of 'The Advancement of Materials for a Sustainable and Greener World' [**25**]. The Advanced Materials Congress serves as the flagship conference of the International Association of Advanced Materials and commenced in 2011 with the mission of advancing materials by creating a highly interactive platform [**1**]. This platform brings together researchers, professionals, scientists, students, industry leaders, policymakers, and various organizations from around the world. It facilitates discussions on new research, innovations, and technology in the realm of advanced materials science, engineering, and technology.

Over the past a decade and a half, about 60 AMC assemblies have successfully established a global presence across Asia, Europe, Australia, and the USA, all contributing to the advancement of materials to global excellence. Reflecting on this journey, it's a source of great pride that AMC assemblies have welcomed over 25,000 delegates from more than 125 countries and hosted 10,000 lectures from over 4,500 prestigious organizations [**1**].

The International Association of Advanced Materials is dedicated to pioneering advancements in materials science and engineering, fostering innovation that contributes to a better future. The IAAM aim for the promotion of advanced materials to global excellence and works R&D, Education & Training, Award & Recognition, International Network of researchers, students, and representatives from academia, industries, policymakers, governance and civil society working in the interdisciplinary fields of advanced materials science, engineering, and technology (**Fig 4**) [**1**]. By becoming a part of this vibrant and diverse network, researchers have the opportunity to collaborate with leading researchers, educators, and professionals from around the world.

IAAM's vision is to drive progress in materials science, aiming for global excellence and sustainability. IAAM's concils (academic, business, youth and women) drive progress in materials science community with aiming for global excellence and sustainability (**Fig 4**). The association's mission revolves around the development of advanced materials that can address the challenges of the 21st century, from climate change to organic technological advancements. IAAM has a vision and mission focused on scientific advancement, sustainability, and global excellence in the field of materials science, engineering and technology:

(a) **Promoting Scientific Advancement for Society:** IAAM is dedicated to fostering a highly interactive community of advanced materials researchers, aiming to stimulate partnerships and contribute to society's betterment through scientific research.

(b) **Utilizing Science & Technology for the Betterment of the World:** The organization emphasizes the use of science and technology to improve the world, aligning with its core values and objectives.

(c) **Advancement of Materials to a Sustainable and Green Future:** In line with the United Nations' agenda for sustainable development, IAAM commits to promoting the advancement of materials towards a sustainable and environmentally friendly future. This reflects their understanding of the importance of a sustainable future for humankind.

(d) **Global Excellence in Advanced Materials:** IAAM has established one of the largest global networks in the advanced materials community, highlighting its commitment to excellence on a global scale.

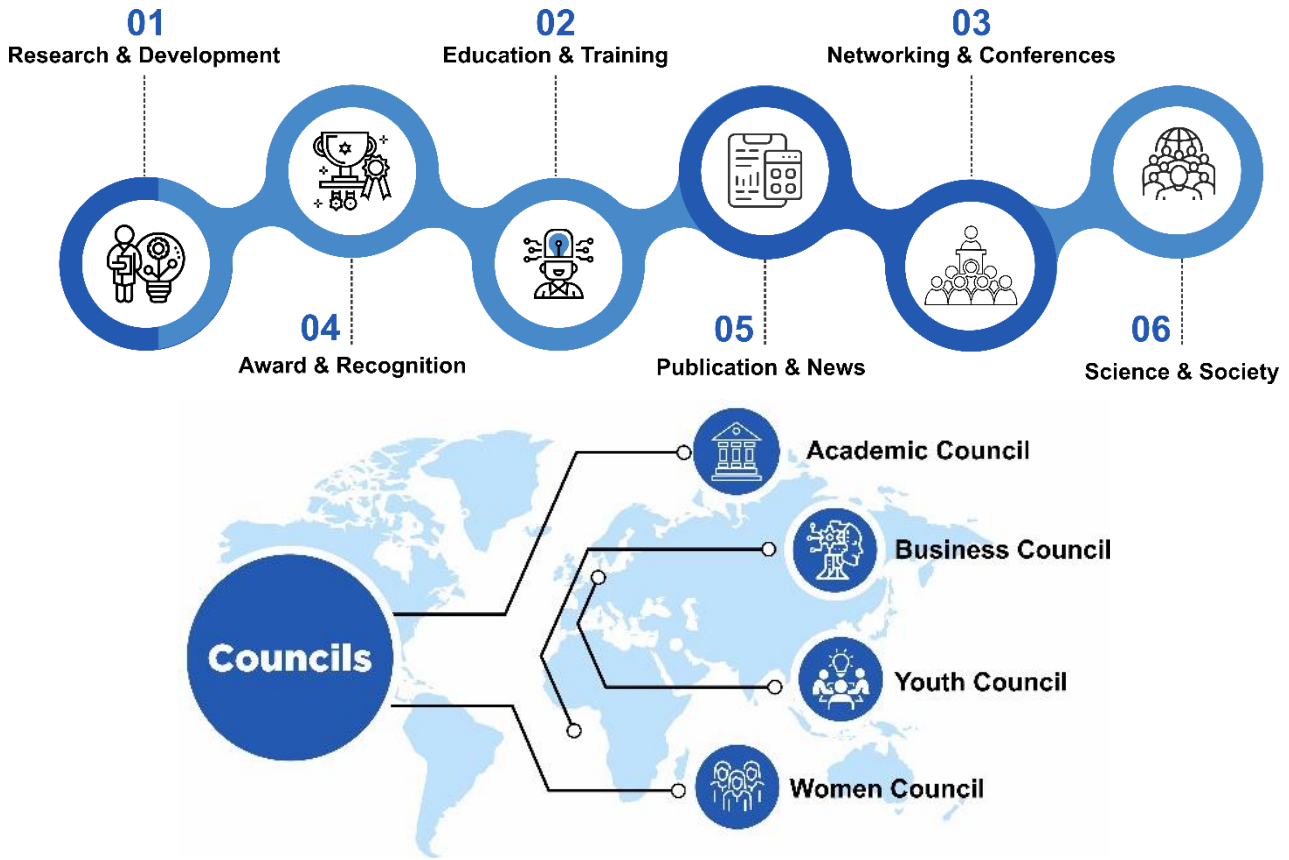

Fig. 4. The IAAM aim for the promotion of advanced materials to global excellence depends on networking, R&D, education & training, recognition, journals and congresses which drive progress in materials science and sustainability. IAAM's community with councils (academic, business, youth and women) drive progress towards global excellence.

These elements collectively define IAAM's guiding principles and objectives, aiming to advance the field of materials science for the betterment of society and the environment. IAAM invites you to join its mission as a key player in the global materials science community. IAAM believes in the power of collaboration and knowledge sharing to accelerate scientific discovery and application.

Joining IAAM places you at the heart of innovative materials science research. As a member, you gain access to global resources including conferences, symposiums, and pioneering publications [**12**]. IAAM fosters a worldwide network of collaboration and creativity, driven by their commitment to open-access knowledge. Their mission is to elevate materials science, enhancing life

quality through high-caliber research. They build a global community focused on next-generation technology and a "Climate Neutral Society", partnering with top research and educational institutions. **Fig. 5** refer the IAAM's global impact in materials science, engineering, and technology with worldwide experts.

IAAM's activities span coordinating research, education networks, and forums in materials science, engineering, and technology, uniting a diverse range of experts to advance the sector. They also offer memberships, scholarships, and awards, encouraging careers in these fields [**12,19-22**].

Awards & Recognition

The IAAM Awards and Recognitions Program aims to acknowledge the significant scientific contributions to the advancement of Materials Research and Innovation [**13**]. The association routinely bestows honors and awards on individuals who have significantly advanced the field of materials. IAAM has honored approximately 4200 outstanding researchers from 75 countries for their excellent scientific contributions. To maintain and enhance the quality of work in various contemporary research fields, IAAM recognizes researchers with the following awards and accolades:

- Advanced Materials Laureate
- Researcher of the Year
- Advanced Materials Award
- IAAM Fellow
- IAAM Medal
- Scientist Award and Medal
- Young Scientist Award and Medal

Fig. 5. IAAM's global impact span coordinating research, education networks, and forums in materials science, engineering, and technology, uniting a diverse range of experts to sustainability.

IAAM Publications

The International Association of Advanced Materials is dedicated to the dissemination of research and knowledge in the fields of advanced materials, materials science, engineering, and technology. Since its founding, IAAM has been publishing a diverse range of academic materials, including journals and books, to support and advance these scientific areas.

In 2010, the International Association of Advanced Materials debuted its inaugural publication, Advanced Materials Letters, an open-access, non-profit international scientific journal [**27,28**]. This journal has been instrumental in disseminating scientific research, offering peer-reviewed, high-quality articles in the fields of materials science, engineering, and technology. Capitalizing on the success of Advanced Materials Letters, IAAM subsequently launched Advanced Materials Proceedings, further broadening the scope of its peer-reviewed scientific content in science and technology [**29**]. In 2020, marking a novel venture in scientific communication, IAAM introduced the Advanced Materials Video Proceedings, an audio-visual journal. This innovative format has garnered significant attention, with an annual viewership of 300,000 per month from over 170 countries [**30**]. Alongside these flagship journals, IAAM has also published various books, articles, and proceedings.

Disseminating knowledge and research

The International Association of Advanced Materials believes that scientific knowledge and research should be accessible to people globally. To support this vision, IAAM publishes open-access journals and books on a not-for-profit basis. These initiatives ensure that the global materials science community stays informed about the latest advancements and progress in the scientific field. By offering free access to its publications, IAAM fosters an environment conducive to innovation, learning, and pioneering. IAAM's global journey reflect its progress across continents and demonstrate its timeline in achieving milestones (**Fig. 6**). In summary, during the last 15 years, IAAM has been instrumental in removing obstacles to knowledge access, greatly contributing to the professional growth of individuals in the fields of materials science, engineering, and technology.

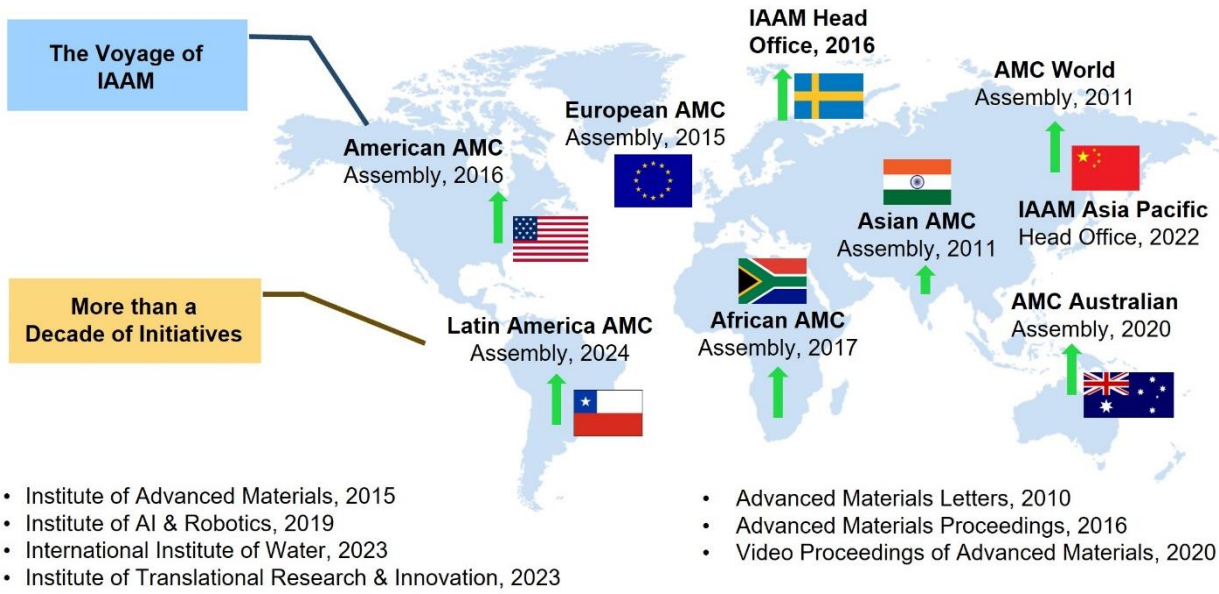

Fig. 6. IAAM's global journey in timeline for the coordinating research, education networks, and forums in materials science, engineering, and technology.

Over the past fifteen years, the International Association of Advanced Materials has orchestrated a series of strategic expansions and initiatives that have significantly advanced the field of materials science towards global excellence. The IAAM's journey is marked by a string of successful assemblies and the establishment of key institutions, each contributing to the domain of advanced materials. In Asia, the inaugural AMC World Assembly in 2011, hosted by Jinan University in China, and the Asian AMC Assembly in the same year, hosted by Delhi University in India, were pivotal in connecting the continent's scientific community. The American AMC Assembly in 2016 in Miami, USA, and the European AMC Assembly in 2015 in Stockholm, Sweden, served as platforms for fostering international collaborations and showcasing cutting-edge research. The founding of the IAAM Head Office in 2016 in Sweden symbolized a commitment to long-term growth and the centralization of expertise. The opening of the IAAM Asia Pacific Head Office in 2022 in China further solidified this commitment.

Australia's engagement was marked by the AMC Australian Assembly in 2020 in Sydney, and the African AMC Assembly in 2017 in South Africa emphasized IAAM's dedication to embracing the diverse scientific landscape of Africa. The upcoming Latin America AMC Assembly in 2024 promises to extend this inclusive approach further. Significant institutes such as the Institute of Advanced Materials and the Institute of AI & Robotics, both established in Ulrika, Sweden, in 2015 and 2019 respectively, reflect IAAM's focus on multidisciplinary research. The International

Institute of Water and Institute of Translational Research and Innovation were inaugurated in 2023, highlighting the importance of sustainable technology and resource management.

IAAM has been at the forefront of knowledge dissemination through its non-profit open access journals. Advanced Materials Letters, initiated in 2010 and publishing from Sweden, was followed by its proceedings in 2019 and the innovative Advanced Materials Letters Video Proceedings in 2020, introducing a multimedia approach to scientific publishing. Continuing its commitment to innovation, IAAM hosted the Translational Research and Innovation Conference in 2021 in China and continued to engage the scientific community through the Baltic Conference Series in 2017 and the World Conference Series in 2018.

The association's global influence was further demonstrated by organizing Parallel Event W119 at the UN 2023 Water Conference at the UN Headquarters in New York, USA, and participating in the 28th Conference of the Parties (COP28) organized by the United Nations Climate Change in 2023 in Dubai, UAE. The Middle East AMC Assembly in 2022, hosted by Abu Dhabi University in the UAE, expanded IAAM's reach into the Middle East.

Honors such as the Researcher of the Year award in 2016, the Advanced Materials Laureate in 2013, the Advanced Materials Award in 2011, and the IAAM Medal in the same year, have recognized individuals who have made groundbreaking contributions to the field. The IAAM's comprehensive and dynamic approach over the past fifteen years has not only advanced the science of materials but has also built a robust global community dedicated to innovation and sustainability in this crucial scientific domain.

REFERENCES

1. The 13th Annual Book of the International Association of Advanced Materials, 'Advancement of Materials to Sustainable and Green World', Ashutosh Tiwari, **2023**, ISBN 987-91-88252-39-5, Ulrika, Sweden.
2. "International Association of Advanced Materials, Research & Development", Accessed on 28 November **2023**, <https://www.iaamonline.org/research-development>.
3. "International Association of Advanced Materials, Councils", Accessed on 28 November **2023**, <www.iaamonline.org/communities-consortium>.
4. "International Association of Advanced Materials, Sustainable Development Agenda for 2030", Accessed on 22 June **2023**, <www.iaamonline.org/sustainable-development-agenda-for-2030>.
5. Ashutosh Tiwari. "Climate Diplomacy to Attain Global Eco-Neutrality". *Advanced Materials Letters*, **2022**, 13, 3, 2203-1697. doi: 10.5185/amlett.2022.031697
6. Ashutosh Tiwari. "Addressing Climate Resilience in the IAAM's W119 Side Event at UN 2023 Water Conference, New York". *Advanced Materials Letters*, **2023**, 14, 2, 2302-1723. doi: 10.5185/amlett.2023.021723
7. Ashutosh Tiwari. "Materials Advances to Achieve One World Climate". *Advanced Materials Letters*, **2022**, 13, 4. DOI: 10.5185/amlett.2022.041704
8. Ashutosh Tiwari. "Advancement of Materials to Sustainable & Green World". *Advanced Materials Letters*, **2023**, 14, 3, 2303-1724. doi: 10.5185/amlett.2023.031724
9. "International Association of Advanced Materials, About IAAM", Accessed on 28 November **2023**, <www.iaamonline.org/about-iaam>.
10. "International Association of Advanced Materials, IAAM Network", Accessed on 28 November **2023**, <www.iaamonline.org/iaam-network>.
11. Ashutosh Tiwari. "Practicing Sustainability through 'NET-ZERO' R&D: A Decades-Long Urgency". *Advanced Materials Letters*, **2023**, 14, 1, 2301-1710. DOI: 10.5185/amlett.2023.011710
12. "International Association of Advanced Materials, Membership", Accessed on 28 November **2023**, <www.iaamonline.org/membership>.
13. "International Association of Advanced Materials, Recognition and awards", Accessed on 28 November **2023** <https://www.iaamonline.org/awards-recognitions>.
14. Institute of Advanced Materials (IAAM), About Us", Accessed on 28 November **2023**, < https://iaam.se/about-us>.
15. International Institute of Water (IIW), Advancing Global Water Expertise", Accessed on 28 November **2023**, < https://iiwater.org/>.
16. Institute of AI and Robotics, A non-profit research and education establishment of IAAM", Accessed on 28 November **2023**, < www.iaamonline.org/iair>.
17. "International Association of Advanced Materials, R&D Networking", Accessed on 05 August **2023**, <https://www.iaamonline.org/r-d-networking>
18. Institute of Advanced Materials (IAAM), Translational Research and Innovation", Accessed on 05 August **2023**, <https://iaam.se/translational-research>.
19. R&D World Links and Decentralized Facilities, Institute of Advanced Materials", Accessed on 14 October **2023**, <https://iaam.se/R&D-world. Accessed 22 Jul 2023>.
20. Institute of Advanced Materials (IAAM), Consortiums", Accessed on 28 November **2023**, <https://iaam.se/projects-consortiums>.
21. Ashutosh Tiwari. "Emergence of R&D World Links for Decentralized Facilities and International Cooperation. *Advanced Materials Letters*, **2023**, 14 (4), 2304-1731.
22. "International Association of Advanced Materials, Consortium and Forums", Accessed on 05 August **2023**, <www.iaamonline.org/communities-consortium>.
23. International Institute of Water (IIW), Mission and vision", Accessed on 28 November **2023**, < https://iiwater.org/vision-mission/>.
24. "Meetings and Events, International Association of Advanced Materials", Accessed on 04 July **2023**, <https://www.iaamonline.org/meetings-events>.
25. "Advanced Materials Congress (AMC), International Association of Advanced Materials, Meetings and Events", Accessed on 04 July **2023**, <https://www.iaamonline.org/advanced-materials-congress>.
26. "International Association of Advanced Materials, 'Knowledge Experience at Sea", Accessed on 28 November **2023**, < www.iaamonline.org/knowledge-experience-at-sea>.
27. "Advanced Materials Letters, International Association of Advanced Materials", Accessed on 22 June **2023**, <https://aml.iaamonline.org/>.
28. Ashutosh, Tiwari; Celebrating 10th Years of Diamond Open Access Publishing in Advanced Materials. *Advanced Materials Letters*, 11(3), 1-2. DOI: 10.5185/amlett.2020.031481.
29. "Advanced Materials Proceedings, International Association of Advanced Materials", Accessed on 22 June **2023**, <https://amp.iaamonline.org/>.
30. "Video Proceedings of Advanced Materials, Open access peer-reviewed video journal", Accessed on 22 June **2023**, < https://www.proceedings.iaamonline.org/ >.