



Closing Session of Academic Year 2020-2021 Report of the Secretary-General

His Excellency, Mr President, Your Excellencies, Messrs. Academician, ladies and gentlemen, dear friends.

We conclude the 2020-2021 academic year by reviewing, as usual, the activities developed by the Royal Academy of Engineering in compliance with its foundational purposes of promoting quality and competence in Spanish Engineering.



The opening of the academic year of the Royal Academies of the Institute of Spain took place on 7 October 2020. It was presided over by H.M. King Felipe VI and attended by Mr Pedro Duque, Minister of Science and Innovation, and the Director of the RAE (Royal Spanish Academy), and was held at the RAE's headquarters.

His Majesty the King opened the session and after the reading of the Royal Academy's Report by the RAE's secretary general, the academic member of the RAE, Mr Mario Vargas Llosa, gave his inaugural speech for the academic year entitled: *"In favour of Pérez Galdós"*.

Since the beginning of the academic year, the Academy has held eight Plenary sessions. In the plenary session held on 20 October 2020, Manuel Doblaré



Castellano was elected as treasurer, and the Governing Board met on ten occasions throughout the academic year.



Academic Sessions

In the academic year 2020-2021, no new academicians have taken office, after the call having been published in the BOE (Official State Gazette) on 30 April 2021 for two new positions of full academicians.

On 24 September 2021, in a commemorative ceremony, the medal and title as corresponding academician was awarded to the Hon. Mr Samuel I. Stupp who gave a lecture entitled "*Self-Assembly of Soft Materials for Advanced Technologies*". The *laudatio* was pronounced by her Excellency. Ms María Vallet Regí, academician and vice-president of the Royal Academy of Engineering of Spain (RAI).



In this academic year the following sessions were held *In Memoriam* devoted to His Excellencies Messrs. Mr Adriano García Loygorri and Mr José Luis Díaz Fernández.

On 26 January 2021, the *In Memoriam* session was held, dedicated to the Hon. Mr Adriano García Loygorri, deceased on 24 March 2020. The President of the RAI, Mr Antonio Colino, gave some words of welcome and then the general secretary, Mr Eloy Álvarez Pelegry, coordinator of the event, introduced the speakers: Mr Jesús Sáenz de Santamaría, Mr Pedro Manuel Rivero, Mr José María Álvarez del Manzano, Mr Miguel Delibes, Mr Ángel Cámara and Mr Adriano García-Loygorri Verástegui, who spoke about Adriano García-Loygorri.





The session took place on 5 October 2021. *In Memoriam* of His Excellency Mr José Luis Díaz Fernández deceased on 24 September 2020. The event began with some welcoming words from Mr Antonio Colino, President of the RAI, followed by Mr Eloy Álvarez Pelegry, Secretary General of the RAI, who introduced the speakers and dedicated a few words in memory of Mr Díaz Fernández. The following took part in the event: Mr Óscar Fanjul, Mr Enrique Locutura, Mr Francisco Elorza, Mr Alfonso Ballester, Mr Juan Ramón Serrano and Mr Javier Díaz Cassou.



During the academic year we unfortunately mourned the death of the academicians Mr Emilio Llorente Gómez, on 23 October 2020 (shortly after the start of the academic year), who held medal number 9; of the academician Mr Joan Margarit, on 16 February 2021, who held medal number 50, and also that of the academician Luis Castañer Muñoz, on 2 May of the current year, who held medal number 23.

Emilio Llorente and Luis Castañer were constituent academicians and all three academicians were highly regarded in professional and academic circles as clear references in their fields of activity. Their deaths are a great loss to our Academy.



The Closing of the Academic Year shall take place today with a keynote speech to be given by His Excellency Mr Avelino Corma Canós, on: *"Transfer of knowledge and technology from public centres to industry. A personal experience"*, and the ceremony will be closed by the President of the Academy.





Awards and distinctions

On 25 March 2021, Ms María Teresa Estevan Bolea was awarded the diploma and sculpture of recognition as a Laureate Engineer by the Royal Academy of Engineering.

The RAI awards this distinction to engineers or architects who have carried out a professional activity that can be considered as a reference and model capable of arousing a technical calling in future generations.

The *Laudatio* was pronounced by Juan Diez Nicolás, professor of the UCM. M^a Jesús Prieto Iaffarge, M^a Cruz Díaz Álvarez and José María de Miguel also participated in the event.

The laureate gave a keynote speech on *"Water, energy and climate change"*.

This academic year, unfortunately, due to the health situation, the Agustín de Betancourt Molina and Juan López de Peñalver awards for young researchers in the field of engineering were not awarded and the *Academiae Dilecta* Prize was not awarded either.



Distinctions to academicians

In the academic year 2020-2021, the following RAI academicians received these distinctions and recognitions:



Nuria Oliver: "Women to Follow Award, Technology section", "Data Scientist 2020" by ESRI; "King Jaume I of New Technologies", first award "XPrize Foundation for the Artificial Intelligence project: Valencia IA4 Covid-19"

Manuel Silva: "Honorary Degree" from the Professional Association of Industrial Engineers of Aragon and La Rioja; and honoured for his career as a professor and researcher in the Department of Computer Science and Systems Engineering of the EINA and for his contribution to the University of Zaragoza throughout his professional life.

Joan Margarit: received from Their Majesties the King and Queen of Spain the *2019 Miguel de Cervantes Literature in Spanish* award.

Avelino Corma: He was granted the PhDhon (Doctor Honoris Causa) by the University of Salamanca.

Javier Ventura Travesset, was awarded the "*Madrid Special Category*" Award.

María Vallet, was considered "*the most important Spanish scientist in the world*" according to Stanford University's latest ranking of research personnel with the greatest scientific impact in the world. And Elías Fereres was considered one of the *most important researchers in the world*, by the same University.

Javier Jiménez Sendín, was recognised as the winner of the *Advance Grant 2020* for his project "Monte-Carlo Determination of causation in turbulence".

Íñigo Losada was granted the "*M. Selim Yalin Career Achievement*" Award" by the International Association for Hydro-Environment Engineering Research (IAHR).

Eloy Álvarez Pelegrý, was appointed "*Ad Honorem Professor*" of the Polytechnic University of Madrid.



Relations with other Academies

Within the context of the relations with the Institute of Spain, our President attended the twelve meetings held by the Governing Board of the Institute.

A joint scientific conference was held on *"Coronavirus"* organised by the Royal Academy of Engineering, together with the Royal Academies of Exact, Physical and Natural Sciences, the National Academy of Pharmacy and the National Academy of Medicine. *Challenges and solutions for COVID-19 from the fields of Engineering, Science and Healthcare*, which took place *online* on 19 and 20 January 2021.

Each conference was divided into two sessions and each session was led by a Royal Academy with the participation of its own academicians, followed by a final debate and colloquium.

At the end of the sessions, the secretaries general made a summary of each one of them and Mr Pedro Duque, Minister of Science and Innovation, closed the Conference.



Closing of Academic Year 2020-2021. Report of the Secretary-General

Memoria Anual 2020-2021
Relaciones con otras Academias



Horarios científicos conjuntos de las Reales Academias de Ingeniería, Nacional de Medicina, Nacional de Farmacia y Ciencias Exactas, Físicas y Matemáticas

CORONAVIRUS. Retos y soluciones para la covid-19 desde los ámbitos de la Ingeniería, la Ciencia y la Sanidad

19 y 20 de enero de 2021

Los contenidos se modulan de forma virtual
Núcleo de San Francisco de Asís
C/ San Francisco, 10
46100 Sagunto

Canal YouTube de la RAE
Primera jornada
Segunda jornada

With the title "*COVID-19: Experiences of a pandemic*", the Institute of Spain organised a conference on 16 May and 21 June 2021 with the participation of the RAI academicians: Francisco Herrera, Enrique Castillo, María Vallet and Nuria Oliver, together with academicians from other Royal Academies.

Memoria Anual 2020-2021
Relaciones con otras Academias



**COVID-19:
Experiencias de una pandemia**

OPUS INTERACADÉMICO 2021 28 Mayo | 1.º y 2.º de junio



Hispanic-American Academies

The Royal Academy of Engineering has had an important activity with Academies of Engineering in Latin America and has signed framework agreements of collaboration with the Academies of Engineering of Mexico (14 April 2021), Argentina (24 June 2021) and Uruguay (24 June 2021).

On 14 April, the ceremony to sign the collaboration agreement between the National Academy of Engineering of Mexico and the Royal Academy of Engineering was held at the Mexican Embassy in Spain.

Within the context of the collaboration agreement with the Mexican Academy of Engineering, a joint colloquium was held on: *Training of Engineers*, on 27th, 28th and 29th September. The Presidents of both academies participated, and in what concerns us, the academicians María Vallet, Jaime Domínguez Abascal, Mateo Valero, José Manuel Sanjurjo, Eloy Álvarez Pelegry and José Ignacio Pérez Arriaga.



Euro-CASE and CAETS

With regard to Euro-CASE, in the context of the promotion of external relations, we have participated in its Board meetings. The Academician Eloy Álvarez Pelegry has been elected member of the Executive Committee of EuroCASE. We also participated in the annual EuroCASE lecture in November with a presentation on "*Energy transition in Europe and the EuroCASE energy platform*".



In what regards CAETS' activities, our representative, Jaime Dominguez Abascal, attended the annual Board meeting promoting the participation of our academicians in the annual meeting organised by the National Academy of Engineering of Argentina, which took place in September with the participation of our academicians.

A nominations committee was also set up and the awards for the six categories were declared.

CAETS' Energy Committee has had a remarkable activity: A global project on decarbonisation is currently under way, in which three of our academicians are involved: José and Jaime Domínguez Abascal and Eloy Álvarez Pelegry. An Education Committee has also been set up and has already taken its first steps.



Conferences and sessions

The RAI in the NETWORK

The RAI in the Royal Academy of Engineering Network consists of two series of seminars that have continued in this academic year.

As part of the Keynote Lecture Series (Series A), on 17 November 2020, Manuel Heitor, RAI corresponding academician and Minister of Science, Technology and Higher Education of Portugal delivered the lecture: "*The Iberian Peninsula in the recovery of Europe, 2021-2026. Towards a joint Spanish-Portuguese Knowledge-based approach for the next decade*".



On 6 May 2021, Josu Jon Imaz, Managing Director of Repsol, delivered the lecture: *"A competitive and just energy transition, based on our industrial and technological capabilities"*.

On 14 September 2021, Michael Lopez Alegria, RAI corresponding academician and Vice President of Business Development for Axiom Space and NASA astronaut (1992-2012), delivered the lecture: *"Human Spaceflight -Past, Present and Future. A look at how we got here, where we are, and where we're going in space. Present, past and future of the special manned flight programme"*.



Security-The Navy

On 24 November 2020, the lecture *"The Navy as an engine of innovation throughout history. Technological challenges for the future ships of the Navy"*, was given by Vice Admiral Manuel Antonio Martínez Ruiz, on the occasion of the 250th anniversary of the creation of the Navy's Corps of Engineers.

The seminar *"NASA's Mars 2020: the third mission with Spanish instrumentation on Mars"* was held on 22 February 2021. Luis Castañer, member of the RAI, introduced the speakers and moderated the colloquium.

On 23 June 2021, the RAI together with the FEINDEF Foundation and the Spanish Engineering Institute, organised a round table discussion entitled *"The future of the Defence and Security industry"*, moderated by the academician José Manuel Sanjurjo, with the participation of Ms Esperanza Casteleiro Llamazares, Secretary of State of Defence.



Within the context of the 11th Naval Week organised by the Spanish Navy, the RAI held a seminar on: "*Naval Thought: The 'Smart' Navy, a challenge anything but artificial*", on 21 September 2021.



As a result of the cooperation between the Royal Academy of Engineering and Fundación La Caixa (La Caixa Foundation), a series of conferences is being held under the title : *Futurists: Engineering and its new challenges*, which began in Madrid in 2020 and continued in 2021 in the cities of Tarragona, Seville and Girona.

The first of the lectures given at CaixaForum Tarragona, "*The engineering of the future: Will we need people or just machines?*", was delivered by RAI academician Antonio Huerta Cerezuela on 18 May 2021.

The second of these lectures, "*Nanoscience and nanotechnology*", was given by RAI academician María Vallet Regí on 25 May 2021.

The third and last of these lectures in Tarragona, "*Climate neutrality and decarbonisation*", was given by Eloy Álvarez Pelegry, RAI academician and secretary general, on 1 June 2021.

The first of the lectures given at CaixaForum Seville, "*Artificial intelligence: fiction and reality*", was given by RAI academician Manuel Doblaré Castellano on 10 June 2021.

The second of the lectures given at CaixaForum Seville, "*Clean energies: we saw the light*", was given by RAI academician José Domínguez Abascal on 17 June 2021.



The third and last of the lectures given at CaixaForum Seville, *"Will we run out of water?"*, was given by RAI academician Elías Fereres Castiel on 24 June 2021.

The first lecture given at CaixaForum Girona, *"The engineering of the future: will we need people or just machines?"*, was delivered by RAI academician Antonio Huerta Cerezuela on 6 October 2021.

The second lecture given at CaixaForum Girona, *"Nanoscience and nanotechnology"*, was given by RAI academician Maria Vallet Regí on 13 October 2021.



Other activities

OBSERVATORY DIGITALISATION OF THE MEDIA

On 28 January 2021, the presentation of the Second Call of *"Impulsa Visión RTVE-Empresas (Sandbox): Automated monitoring of RTVE broadcast signals. Application of Artificial Intelligence techniques"*.

On 1 June 2021, the conference *"UHD, a new look at RTVE's audio-visual heritage"* took place. RAI academician Miguel Ángel Lagunas gave a welcome speech, followed by Pere Vila, RTVE Technology Strategy and Digital Innovation Manager, introduce the different speakers.

On 10 June 2021, the *"Seminar on artificial intelligence (AI) applied to news programmes"* took place. At the end of the round table, the book: *"Artificial*



intelligence applied to news programmes. Research report on AI and journalism” was presented.

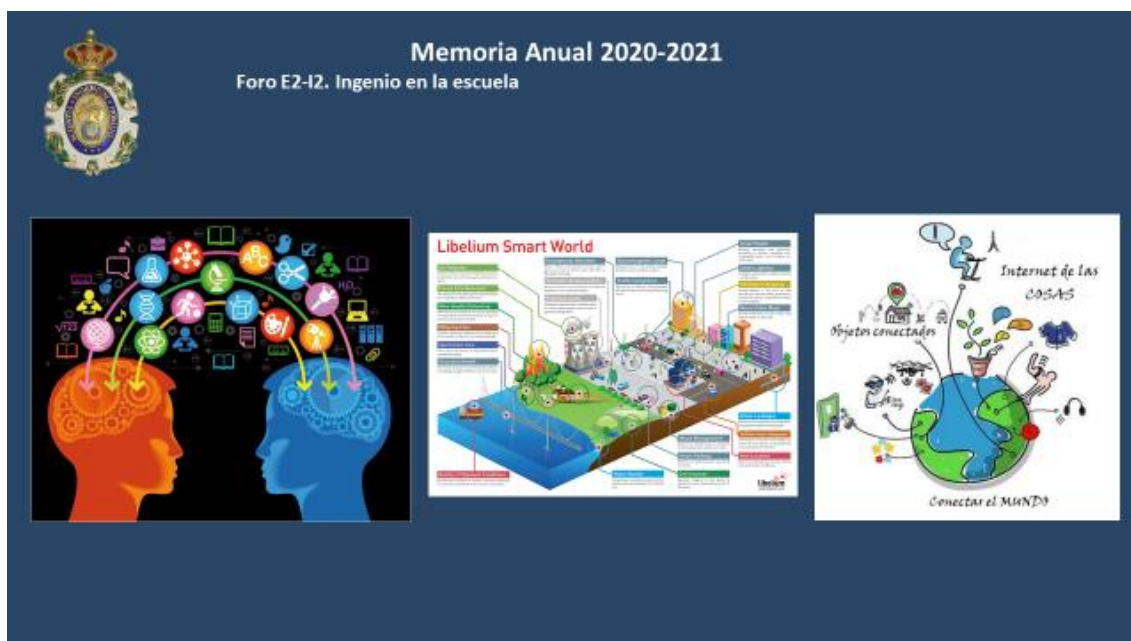


E2-I2 Forum: ingenuity at school

The "*E2-I2 Forum: ingenuity at school*", led by academicians Luis Castañer and Elías Muñoz, focused in this academic year on courses related to the "Internet of Things" through several training courses for secondary education and FP (Professional Training) teachers and professors with the aim of helping their training in educational tools and kits.

The courses were about:

- "*Internet of Things (IoT): Introduction to IoT with the Arduino platform and the ESP32 chip*"
- "*How to foster innovation in the classroom*". The course concluded with the production of a complete innovation project in the classroom, in the image of which teachers may teach this in their environment.
- "*Starting with Internet of Things (IoT) Professional Applications*"



Women and Engineering project

Regarding project activities *Mujer e ingeniería* in the academic year 2020-2021.

On 26 January 2021, Her Majesty Queen Leticia attended the *first meeting of the Women and Engineering Strategic Board*, whose objective is to work together to recognise, activate and make the most of female talent in our society.

On 24 June, the Strategic Board presented at the RAI's headquarters, a *statement* of intentions drafted and approved by its members, which aims to highlight the importance of women's talent in a new model of engineering, focused on people and on the sustainability of the planet.





The 5th Edition of the Excellence Mentoring Programme has had the participation of 80 students from the last years of undergraduate and master's degree in Engineering and other STEM degrees. This edition's presentation took place on 14 April 2021, with the presence of the academican Nuria Oliver. After holding the training and work meetings, this edition's closing ceremony took place on 6 October 6th in an event that was held in the Assembly Hall of the Ministry of Science and Innovation, with the participation of Diana Morant, Minister of Science and Innovation.

The *1st Edition of the Excellence Mentoring programme at the Polytechnic University of Cartagena*, had 15 students from the last years of undergraduate and master's degree in Engineering. The presentation of this first edition took place on March 18 and the closing date was on 15 October 2021.

RAI and ADIF have launched the *2nd edition of the LIDERA Mentoring in Company programme*, which has allowed mentoring 37 women employees of the company.

On 20 November 2020, a new *M&I Breakfast* took place where the Professional Association of Telecommunications Engineers presented the best practices of gender diversity management that are being developed in their professional association to all members of the Women and Engineering community.

Entitled: *Women, leading technological change*, Oracle and Women and Engineering organised a series devoted to women in business. Three sessions dealing with topics such as the keys to success based on experience, projection of young talent and the value of diversity.

The RAI, as part of its Women and Engineering project, together with Siemens Gamesa, launched the *1st TECHMI - Siemens Gamesa edition*.



Publications and presentation of publications

The following publications were published in academic year 2020-21: "*5G in perspective*", by Academician Miguel Ángel Lagunas, "*Exploring the icy moons of the giant planets*", by Academician Juan Ramón Sanmartín Losada, "*Artificial Intelligence and Digital Technologies for the SDGs*", led by Academician Francisco Herrera, and "*In Memoriam of His Excellency Mr Adriano García Loygorri*".





Presentation of publications

The report *"Emissions of greenhouse gases in the Spanish agri-food system"* was presented in academic year 20-21. The study, which began in 2019, has a broad historical scope, as it covers the entire process of industrialisation of agriculture and the Spanish agri-food system. It was presented on 19 April 2021.

On 23 March 2021, Javier Aracil, academician of the RAI, presented his book *"Añoranzas y desengaños. Una vida en una escuela de ingenieros"* (Nostalgia and disappointment: A lifetime in an engineering school). Antonio Colino, President of the RAI, gave a welcoming speech, followed by an interesting discussion between Javier Aracil and Manuel Silva.

On 7 April 2021 the report *"Women's digital entrepreneurship in Spain: Situation and prospective: women, technology and digital society"*.

Finally, on 27 April, the publication *"Trazas y negocios. Ingenieros empresarios en la España del siglo XX"* (Traces and business: Entrepreneurial engineers in 20th century Spain) was presented at the RAI.



On 16 March 2021, the RAI academician, Mr Manuel Silva, editor of the collection The event took place in the Assembly Hall of the Ministry of Science and Innovation.

On 7 July 2021, Jorge Azcón, Mayor of Zaragoza, received the Técnica e Ingeniería en España (Technique and Engineering in Spain) collection from the hands of



Manuel Silva, which will remain in the Board of Trustees of Education and Libraries of the Zaragoza City Council.

It should be noted that the first four volumes of the collection "Técnica e Ingeniería en España" are now available in free-to-air access.



Spanish Engineering Dictionary

A notable boost has been given during the academic year ending today to update the Spanish Engineering Dictionary. The area managers have been reviewed and the supervisors of different sub-areas and sections have been identified for such purpose. Meetings have also been held with those responsible for managing and leading the updating of the Dictionary, and with people and institutions in order for the updated version to have and incorporate the latest existing techniques.

Last but not least, contacts have been initiated within the scope of the framework collaboration agreements with Latin America's academies to establish their incorporation in the Dictionary's updated version.

Palabra de ingeniero (Engineer's word)

RAI's participation in the Radio5 programme "Palabra de Ingeniero" has continued with a large representation of academicians who explain different words and terms to the audience. The academic year saw the participation of the following academicians: Eloy Álvarez Pelegry, Javier Aracil, Pere Brunet, Luis Castañer, Enrique Castillo, Manuel Doblaré, Elías Fereres, Luis Gil, Francisco



Herrera, José Antonio Martín Pereda, Daniel Ramón Vidal, José Manuel Sanjurjo, Mateo Valero and María Vallet.



Acknowledgements

The performance of the activities listed here has been possible thanks to the support of the Ministry of Science and Innovation.

We must also thank our co-operators and institutions, the Fundación Pro Rebus Academiae and the companies that support us for their generosity, and also all academicians for their contribution to the activities, works, studies and committees, and all the RAI staff and its management team.

Given the nature of this participation, I invite you to view the Royal Academy of Engineering's website, where you can find further details about academic life, the activities, and the selection of cooperating companies which, given the large amount, cannot be listed here.

As a result of the pandemic situation, the activities have been adapted to the health requirements. However, we understand that the Academy has maintained a remarkable activity to continue fulfilling its purposes.



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Memoria Anual 2020-2021
Empresas e instituciones colaboradoras



Logos of collaborating companies and institutions:

- adif, adif, aemener, AIRBUS, Ametic, Caja de Ingenieros
- CAM NOS MADRID, COGITI, it, it, DELL technologies, renováveis
- endesa, esri España, ferrovial, ACS, IDOM, IBERDROLA
- gmv, Google, gradient, IBERIA, IDOM, Indra
- rtve, sage, SAMSUNG, SENER, SIEMENS Gamesa, Telefónica
- Tragsa, vicomtech, uc3m, Universidad Carlos III de Madrid, ue, Universidad Europea, Universidad Politécnica de Cartagena
- CEU, Universidad de Sevilla

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Thank you



Muchas gracias!!!



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