



NUCLEAR OLYMPIAD
2019



Nuclear Olympiad 2019

Report

Contents

Introduction.....	3
Participation in the Nuclear Olympiad 2019.....	4
Nuclear Olympiad Stages	4
Stage 1 - Video preparation and promotion	4
Stage 2 - Interview	4
Stage 3 – Public survey and written report	5
Final Stage – Oral presentation at IAEA	6
Judging.....	8
Certificate	8
Winner	8
Social Media Coverage	8
APPENDIX 1 – Terms and Conditions.....	10
APPENDIX 2 – Videos submitted for the WNU Nuclear Olympiad 2019	15
APPENDIX 3 – WNU Nuclear Olympiad 2019 Judges.....	16

Introduction

The World Nuclear University Nuclear Olympiad [2019](#) was the 4th WNU Nuclear Olympiad, and had the aim of contributing to effective public communication on nuclear science and technology. This objective was reinforced throughout the various stages, where participants were requested to learn about nuclear technologies and develop their communications skills using videos, interviews, surveys, written reports, and oral communication in an international setting.

WNU and the International Atomic Energy Agency's Department of Nuclear Sciences and Applications signed an agreement in January 2019 to organize jointly the Final stage of the competition at the IAEA headquarters in Vienna, Austria. The contact point at IAEA was Joao Alberto Osso Junior, Section Head of the Radioisotope Products and Radiation Technology Section, who was also the Scientific Secretary of the IAEA International Symposium on Trends in Radiopharmaceuticals (ISTR-2019), during which the Olympiad Final took place on 1st November 2019.



WORLD NUCLEAR UNIVERSITY

IAEA
International Atomic Energy Agency

NUCLEAR OLYMPIAD 2019

A unique opportunity for University students to build a top global professional network while contributing to nuclear communications.

Stage 1: Submit a up to 3-minute video on any aspect of radiation applications by 26th April 2019

Stage 2: Chat with us

Stage 3: Let us know about public opinion in your country

Finalists will make an oral presentation at an international setting event

Find more at:
world-nuclear-university.org



Figure 1 Flyer used to promote the WNU Nuclear Olympiad 2019 until the application deadline, listing the stages of the competition

“It was inspiring to see such drive and ambition from every team that entered the 2019 World Nuclear University Nuclear Olympiad. They displayed impressive communication skills on the topic of nuclear science and technology and I am confident that they will be making a big impact on the nuclear industry in the future. The Nuclear Olympiad is a great opportunity for the next generation to have their voice heard in an international setting, connect with major nuclear organizations and elevate their career.”

Vaishali Patel
WNU Nuclear Olympiad 2019 Final Judge

Participation in the Nuclear Olympiad 2019

The competition was open to students from any discipline, and there was significant variety in the participant profiles and home countries. The participants were from Brazil; China mainland and Taiwan, China; India; Indonesia; Italy; Jordan; Kenya; Malaysia; South Korea; UK; and the USA.

Their degree programmes included nuclear engineering; chemical engineering; nuclear science; quantum system engineering; mechanical engineering; electrical engineering; radiodiagnosis and imaging technology; climate change and sustainable development; physics; and materials science.

The instructions for each of the stages can be read in the [Terms and Conditions](#) (Appendix 1). The following subsections are an overview of each the stages.

“Attending the WNU Nuclear Olympiad was one of the best experiences of my life. At first I was wondering if I should sign up, but then I didn't regret it for a second.”
- Thiago Almeida (2019 Olympiad finalist)

Nuclear Olympiad Stages

Stage 1 - Video preparation and promotion

The original deadline to enter the 1st stage was 26th April 2019, but this was extended until 10th May 2019. In the 1st stage of the Nuclear Olympiad, candidates prepared and submitted videos of up to 3 minutes, related to any use of radiation sources or radiation generating equipment in medicine, space, generation of electricity, desalination, industry, agriculture, or consumer product, concerning specific aspects such as technology, environment, socioeconomics, energy planning, or business. There was an emphasis on the clarity of the message to all audiences, and the entertainment value of the video. The video could be prepared in the participant's local language, for better public communication, provided there were subtitles in English.

In the 1st stage, there were 20 video submissions, (Appendix 2) from a total of 38 students (8 individuals and 12 teams). The videos were uploaded to YouTube or YouKu by the participants, and mentioned “WNU Nuclear Olympiad 2019” in the description.

WNU posted the accepted videos to the WNU [website](#), and public voting on the best video was opened from 14th May to 11th June, using a SurveyMonkey platform. Participants were encouraged to share the videos to get more votes. An international jury panel evaluated the impact, originality, and relevance of the videos and assigned points to them – 4 points for 1st place, 3 points for 2nd place, and 2 points for 3rd place. All other videos received 1 point. The 10 videos with the highest number of votes also received an additional point. A total of 5361 votes were received and over 15000 views of the videos as of December 2019.

The videos were widely promoted by WNU on a dedicated YouTube playlist and via social media. The WNU played the videos at their stall at World Nuclear Association's Symposium, 4-6 September 2019 in London, as well as providing informational flyers about the Olympiad.

Stage 2 - Interview

Candidates were interviewed by phone or video conference by an interviewer appointed by WNU from 11-14 June 2019. A panel of judges evaluated the knowledge, communication skills, and motivation of the participant. In this stage, a point could be deducted if the candidate failed, according the criteria set out in the Terms and Conditions.

The questions asked by interviewers were:

1. How did you hear about the WNU Nuclear Olympiad and how did you decide to participate?
2. Name one radionuclide produced in reactors and one produced in particle accelerators?
3. Have you visited a nuclear installation or lab? What was your impression?
4. How was the video promotion experience, are you increasing your network, while promoting the video?
5. What was the largest audience you have ever spoken to? What was the topic and how did you prepare?
6. Would you like to continue studying in an area related to nuclear? Which topics attract you the most?

Stage 3 – Public survey and written report

Participants were asked to run a public survey and write a report on public opinion about nuclear science and technology in their respective countries. This report was to include existing recent data about public opinion in their country, in addition to the results of the public opinion survey conducted by the participant, with a minimum of 100 responses. The questions asked in the survey were supplied by WNU, but participants were free to add any further questions. The report was reviewed by the professor who had supplied the recommendation letter to the participant. The submitted reports [can be accessed here](#).

Not all the participants submitted their reports and for this stage of competition there were 15 participants. An international expert jury panel evaluated the reports on the comprehensibility and logical structuring of the text, the data-collection supported by specific evidence, and the creativity and innovative approach in providing conclusions. They awarded 5 points to the winner of this stage, 4 points to 2nd place, and 3 points to 3rd place.

The questions asked by the participants in their surveys were:

- a) Country where you live in: [text]
- b) Do you know what a radiopharmaceutical is? [yes/no].
- c) Radiopharmaceuticals are radioactive drugs that can be used for diagnosis and therapy of diseases. Have you ever taken any radiopharmaceutical for medical diagnosis or treatment? [yes/no]
- d) Are radiopharmaceuticals produced in nuclear reactors or accelerators? [multiple choice: nuclear reactors; accelerators; some in reactors and others in accelerators; none]
- e) Overall, do you strongly favor, somewhat favor, somewhat oppose, or strongly oppose the use of nuclear energy as one of the ways to provide electricity in your country? [multiple choice: strongly favor, somewhat favor, somewhat oppose, or strongly oppose]
If you oppose the use of nuclear energy, could you explain why? [text]

The results varied by region, although some answers were surprisingly consistent. For example, roughly 10% of people around the world seem to have taken radiopharmaceuticals. On the public opinion of nuclear technologies question the results were surprisingly consistent across the globe, and the average of the results can be seen in Figure 2.

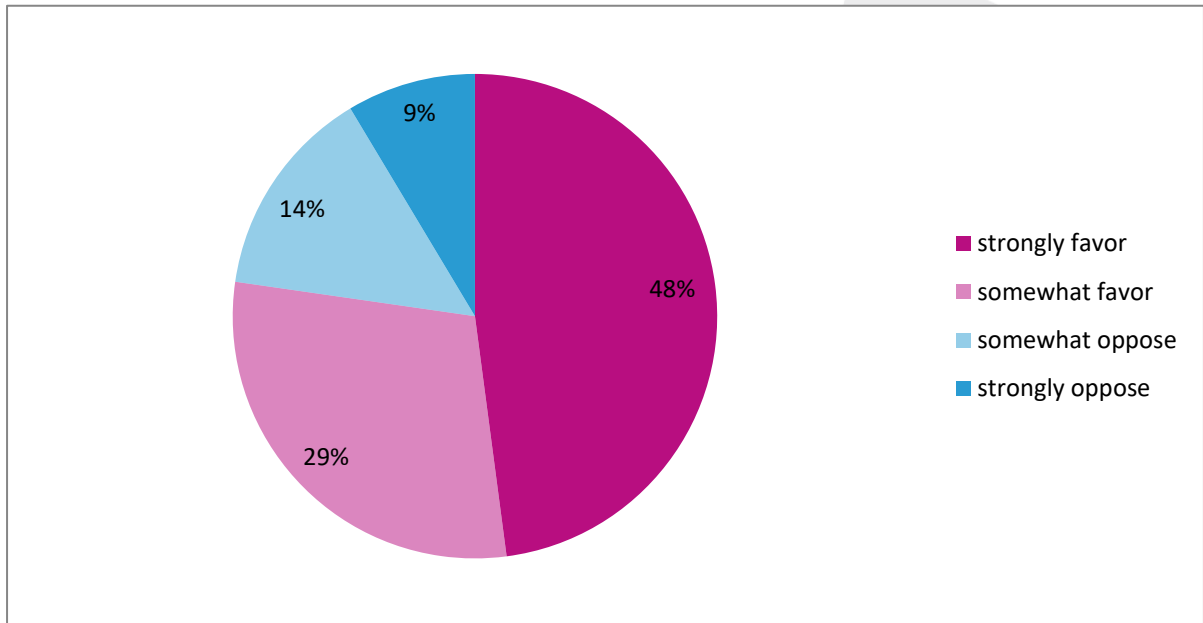


Figure 2 Average of answers to question e) Overall, do you strongly favor, somewhat favor, somewhat oppose, or strongly oppose the use of nuclear energy as one of the ways to provide electricity in your country?

Final Stage – Oral presentation at IAEA

The points from the three stages were summed, and the 4 participants with the highest total of points qualified to take part in the Final. They were supplied with [presentation guidelines](#).

The four finalists consisted of 3 teams from Brazil and China, and an individual from the USA.

- Vitor Fernandes de Almeida, Anna Flávia de Freitas Valiante Peluso, Edilaine Ferreira da Silva, Luciana Sampaio Ribeiro, and Nathália Silva de Medeiros
Professor: Amir Zacarias Mesquita
Nuclear Technology Development Center/Brazilian Nuclear Energy Commission, Brazil
- Thiago Almeida and Lucas Schmidt.
Professor: Andressa dos Santos Nicolau
Federal University of Rio de Janeiro, Brazil
- Shang Tian, Qize Liu, Sunci Wu, and Maheng Ye
Professor: Changran Geng
Nanjing University of Aeronautics and Astronautics, China
- Zachary Deziel
Professor: Aaron Dahlen
Three Rivers Community College, USA

Participants were encouraged to fully attend [ISTR-2019](#), and IAEA arranged a technical tour to their Laboratories at Seibersdorf on 31st October for all finalists and their professors. Later that day, participants enjoyed a dinner at a Viennese Heuriger.



Figure 3 WNU Stall at ISTR-2019 showing Stage 1 videos on the screen

The session of the final stage of the Olympiad at IAEA was introduced by Patricia Wieland, Head of the WNU, and Melissa Denecke, Director of NAPC/NAof IAEA. The 4 finalists presented their public survey reports in 15 minutes each. All presentations were filmed by IAEA and can be watched [here \(from 2h17min45\)](#).

In the case of teams, the team leader made the presentation. The final stage was evaluated by a panel of judges. The judging criteria were taken from the Terms and Conditions, and were:

- a) Presentation of the main message within the time frame;
- b) The visual aid material is attractive and understandable;
- c) The presentation follows a logical sequence from introduction to conclusion with relevant and memorable “take home points”;
- d) The presentation is performed with eye contact with the audience and enthusiasm.

The scores were calculated as soon as the last presentation was completed, and the winner was announced on the day.



Figure 4 Participants, professors, judges, and WNU and IAEA organizers at the Final

Judging

All stages of the WNU Nuclear Olympiad were judged by panels of international expert judges. They included individuals from WNA, IAEA and from other organisations. The list of judges from the [1st](#) and [3rd](#) stages and the [Final](#) are in the Appendix 3.

Certificate

Certificates were awarded to those who took part in the Final. Certificates of participation were emailed to all groups and individuals who participated in the 1st stage.

Winner

The 2019 WNU Nuclear Olympiad winner team is: Vitor Fernandes de Almeida, Anna Flávia de Freitas Valiante Peluso, Edilaine Ferreira da Silva, Luciana Sampaio Ribeiro, and Nathália Silva de Medeiros from the Nuclear Technology Development Center/Brazilian Nuclear Energy Commission, Brazil.

The prize for winning the Nuclear Olympiad 2019 was the travel, accommodation, and free participation in the WNU short course 'The World Nuclear Industry Today' for the team leader of the winning group. This encourages the winner to continue studying or working in the nuclear area, and expands their network to include other short course participants.

Social Media Coverage

The WNU Nuclear Olympiad attracted attention not only from the usual users, but also from researchers and students, from many areas, not only from the nuclear area.

The Final generated some media coverage, although this was mostly in Brazil - the country of the winning team. Of note was the social media attention garnered when the Twitter account of the President of Brazil shared one of these stories, seen in Figure 5. The post has a [link](https://www.youtube.com/watch?v=uxRS_aPw4Ug) to the video made by a Brazilian webTV channel with images of the moment the winner was declared (https://www.youtube.com/watch?v=uxRS_aPw4Ug). The Minister of Energy and Mines in Brazil, Bento Albuquerque, congratulated the team in person (Figure 6).



Figure 5 President of Brazil's Tweet regarding WNU Nuclear Olympiad 2019



Figure 6 Brazilian Minister of Energy and Mines congratulated the Olympiad winning team

APPENDIX 1 – Terms and Conditions



WNU Nuclear Olympiad 2019

In collaboration with IAEA and World Nuclear Association

Terms and conditions

1. The WNU Nuclear Olympiad 2019, hereafter referred to as the Nuclear Olympiad, aims to contribute to **effective public communication on nuclear science and technology**.
2. The Nuclear Olympiad is open to undergraduate and graduate students from any Faculty or School, aged 18 to 28 years old, and from all nationalities.
3. The Nuclear Olympiad is open to individual or group submissions. In case of group submissions, one team leader must be selected to represent the team in subsequent rounds.
4. Submissions, including video description, tags, interviews, written essay and oral presentation, **should be in English**; however, the video should be in the candidate country's official language and be **subtitled in English**. If there is more than one official language, the candidates should decide which to use.
5. The Nuclear Olympiad is not open to WNU secretariat and staff from collaborating institutions.

First Stage: create and promote a video

6. In the first stage of the Nuclear Olympiad, candidates should create an entertaining video of **up to 3 minutes**, related to any use of radiation sources and radiation generating equipment in medicine, space, generation of electricity, desalination, industry, agriculture, or consumer product, concerning specific aspects such as technology, environment, social, economics, energy planning, or business.
7. The video can be storytelling, interviews, or an animation, but should be easy to understand and avoid the use of scientific or technical jargon. The video should have a simple and clear message that a public audience with little or no nuclear knowledge will understand.

8. Create a title for the project that captures the message behind the video. Please do not include the candidate name and country in the title. Upload the video to YouTube, or YouKu in China, for public viewing, under the account that has your full name and with a description of up to 500 words, explaining the content of the video. The following terms should be included in the description: “radiation”, “technology” and “WNU Nuclear Olympiad 2019”.
9. Apply to the Nuclear Olympiad by sending an e-mail to wnu@world-nuclear.org with the subject: “WNU Nuclear Olympiad 2019” by Friday, 10 May 2019, 17:00 UTC with the following information:
 - a) Full name, LinkedIn address (or short bio with photo), e-mail, and mobile phone number of the team members, or individual. If the video is submitted by a team, please indicate who is the team leader;
 - b) Recommendation letter from a university professor. This letter should describe briefly how the professor knows the team leader and briefly describes the candidate’s communication skills and leadership potential. The letter must contain full name of the professor, contact e-mail, telephone number and LinkedIn address (or short bio with photo);
 - c) Country/region;
 - d) URL for the YouTube or YouKu video;
 - e) A scanned copy of the team leader’s or individual’s valid university identity card with photo;
 - f) A short paragraph stating the educational background, professional ambitions, hobbies, and motivation to participate in the WNU Nuclear Olympiad.
10. The submitted videos will be analysed by the WNU Coordination Centre according to adherence to the theme, as described in item 6. Should a video not be accepted, the authors will be contacted as soon as possible.
11. WNU will post the accepted videos on the WNU website and social media for public vote. The voting system will be via a survey, its link will be provided by WNU, and the public voting will start on **Tuesday, 14 May 2019**. The candidates should promote their videos to get more votes.
12. On **Friday, 17 May 2019**, the jury panel will evaluate the videos according to the following criteria:
 - a) Impact - To have a powerful effect on the viewer;
 - b) Relevance - To be relevant to the current global situation and context;
 - c) Originality - To be original, creative and visually stimulating.
13. The winning video according to the jury panel will receive 4 points, the second will receive 3 points, and the third will receive 2 points. The others will receive one point from the judges.

14. At 10:00 UTC on **Tuesday, 11 June 2019**, the WNU will verify the result of the public votes. The authors of the 10 videos with the highest number of public votes will receive 1 point each in addition to the jury panel score.

Second stage: Interview

15. The candidates will be interviewed by telephone or video conference (e.g. WebEx or Skype) about the topic of their video. The duration of the interview is maximum 15 minutes and date of the interview will be from **11 to 14 June 2019**.
16. The interviewer will inform the candidates about the results of both public vote, as well as jury panel evaluation and check the following elements:
- a) Knowledge - If the candidate demonstrates knowledge on the topic of the video.
 - b) Communication skills - If the candidate expresses thoughts clearly; is able to reply to the questions in a logical way; radiates enthusiasm; and is able to respond convincingly.
 - c) Motivation - If the candidate demonstrates an interest in further studies and working in the nuclear area, and shows a strong determination to proceed to the next stage of the Nuclear Olympiad.
17. The candidate shall lose maximum one point if he/she fails in any element of the interview. The candidate is out of the competition if he/she misses the interview appointment without previous justification.

Third Stage: Listen to the public

18. Write a report (maximum of 5 pages, including cover, photos, graphs and references) on the public opinion about nuclear science and technology in your country that includes reliable data with references, how the data was collected, conclusion and recommendations. It does not need to be related to the video.
19. This report should include preferably existing recent data about public opinion about nuclear science and technology in your country, like in research polls. For this part we suggest contacting national nuclear associations or related agencies that might have this information.
20. The candidates should also run a public survey using at least the following set of questions with a minimum of 100 respondents:
- a) Country where you live in: [text]
 - b) Do you know what a radiopharmaceutical is? [yes/no].
 - c) Radiopharmaceuticals are radioactive drugs that can be used for diagnosis and therapy of diseases. Have you ever taken any radiopharmaceutical for medical diagnosis or treatment? [yes/ no]

- d) Are radiopharmaceuticals produced in nuclear reactors or accelerators? [multiple choice: nuclear reactors; accelerators; some in reactors and others in accelerators; none]
 - e) Overall, do you strongly favor, somewhat favor, somewhat oppose, or strongly oppose the use of nuclear energy as one of the ways to provide electricity in your country? [multiple choice: strongly favor, somewhat favor, somewhat oppose, or strongly oppose]
 - i. If you oppose the use of nuclear energy, could you explain why? [text]
21. The report should be reviewed by the professor, who sent the recommendation letter.
22. The written report should be sent in pdf format to wnu@world-nuclear.org by no later than **Thursday, 15 August 2019, at 17:00 UTC**.
23. The jury panel will evaluate the reports according to the following criteria:
- a) Comprehensibility of the text;
 - b) Logical structuring;
 - c) Well-developed data collection that is supported with specific evidence;
 - d) Creativity and innovative approach in providing the conclusions.
24. The winner of this stage will receive 5 points, the second place 4 points and the third place 3 points. The results will be informed to the candidates from **Friday, 13 September 2019**.

Fourth and Final stage: Oral presentation

25. The candidate's scores of the stages will be summed. The **4** finalists, who have received the highest score in total (maximum 10 points), plus their professors, will receive economy return travel and accommodation, in order to present their report orally within **15 minutes** at the IAEA Headquarters in Vienna, Austria, alongside the IAEA International Symposium on Trends in Radiopharmaceuticals that will be held from **28 October to 1 November 2019**.
26. After the presentations, the evaluation of the final stage will be made by a jury panel, who will select the **WNU Nuclear Olympiad 2019 winner**, based on the following criteria:
- a) Presentation of the main message within the time frame;
 - b) The visual aid material is attractive and understandable;
 - c) The presentation follows a logical sequence from introduction to conclusion with relevant and memorable "take home points";
 - d) The presentation is performed with eye contact with the audience and enthusiasm.

27. The winner will be granted the travel, accommodation and free participation in a WNU Short Course “The World Nuclear Industry Today”.

Further terms and conditions

28. By applying for the Nuclear Olympiad, all participants agree to be bound by the present Terms and Conditions of the World Nuclear Association privacy policy.
29. By applying for the Nuclear Olympiad, all participants agree that their submissions to the Nuclear Olympiad might be used in the WNU promotional material.
30. Participants must make sure that they have the right to publish and distribute all the material in their videos, and provide references where appropriate. The WNU accepts no liability for the content or publication of video submissions to the Nuclear Olympiad.
31. The WNU reserves the right to disqualify any participants, who do not abide by the rules and regulations, or who are deemed by the competition judges to be acting unfairly, including plagiarism. WNU reserves the right to disqualify votes originating from non-human or questionable sources (bots/automatic computer generated votes).
32. The participants should inform WNU as soon as possible if they do not want to continue in the competition. If a participant cannot be contacted or does not have all supporting documents, he/she will not be considered for the next stages of the competition.
33. WNU and its collaborating organizations accept no liability for entries lost, damaged, or delayed.
34. There is no alternative prize to the Nuclear Olympiad award.
35. The jury panel decisions are final.
36. In the event of unforeseen circumstances, the WNU reserves the right to alter or amend the rules and regulations of the Nuclear Olympiad.

APPENDIX 2 – Videos submitted for the WNU Nuclear Olympiad 2019

[WNU Nuclear Olympiad 2019 YouTube playlist](#)

- A Nuclear Technology for State of the Art Medicine
Sheila Kamotho, Kenya
- B Food for All using Gamma Irradiation
Aditya Chincholkar, India
- C Applications of Radio Isotopes in Medical Diagnosis
Bharat Rawat, India
- D The Nuclear Applications In Indonesia's Agriculture
Luqman Hasan Nahari, Indonesia
- E A Cosmic View on Radiation
Hemantika Sengar, India
- F Reaching a Bright Future
Darian Victor Iulius Figuera Michal, South Korea
- G Gamma Irradiation and its Applications
Sachin Singh, Italy
- H Application of Nuclear Science and Technology in Medical Field
Pratiti Phukan, India
- I Go Green with Nuclear
Po Yu Chen, Taiwan, China
- J Uses of Radiation in Our Lives!
Vitor Fernandes de Almeida, Brazil
- K Radiation for Better Life
Mutaz farouq abdallah AL-shannag, Jordan
- L Radiation for Food Security
Bruce Kerongo, Kenya
- M Nuclear Technology Applied in Seawater Desalination
Thiago Augusto de Almeida, Brazil
- N PET-CT Scan
Amzar Khalili bin Khalid, Malaysia
- O The Era of Space Reactors is Coming (YouKU)
Tian Shang, China
- P Powerful Power Source for Deep Space Exploration: RTG (YouKU)
Zihao Liu, China
- Q Dividing Atoms and Opinions
Liam Harnett, UK
- R The Power of Radiation
Zachary Deziel, USA
- S Food Irradiation and Radiation in Healthcare impacting Human Lives
Piyush Sikka, India
- T Application of Neutron Activation Analysis in the Assessment of Atmospheric Pollution
Igor Felipe Silva Moura, Brazil

APPENDIX 3 – WNU Nuclear Olympiad 2019 Judges

Stage 1

Vaishali Patel

Marketing and Communication Manager, World Nuclear Association

Dhruv Dharamahi

WNU Nuclear Olympiad 2016 Winner. Co-Founder and Brand Manager, VoxForth

Koji Kakehashi

Visiting Research Officer, World Nuclear Association

Alice Cunha da Silva

WNU Nuclear Olympiad 2015 Winner

Stage 3

Ann Bisconti

Founder and President, Bisconti Research Inc.

Aruna Korde

Technical Officer, IAEA

Joao Alberto Osso Junior

Section Head in Physical and Chemical Sciences Division, IAEA

Valeriia Starovoitova

Radiation Technology Coordination Officer, IAEA

John Lindberg

Writer and Analyst, World Nuclear Association

Final Stage

Vaishali Patel

Marketing and Communication Manager, World Nuclear Association

Aleksandra Peeva

Communication Officer, IAEA

Naoual Bentaleb

Radiopharmacist Responsible, Head of radiopharmaceuticals production division, CNESTEN

Valery Radchenko

Research Scientist, TRIUMF

Alina Constantin

Researcher, Institute for Nuclear Research Romania. Consultant, IAEA. Consultant, World Nuclear Association.