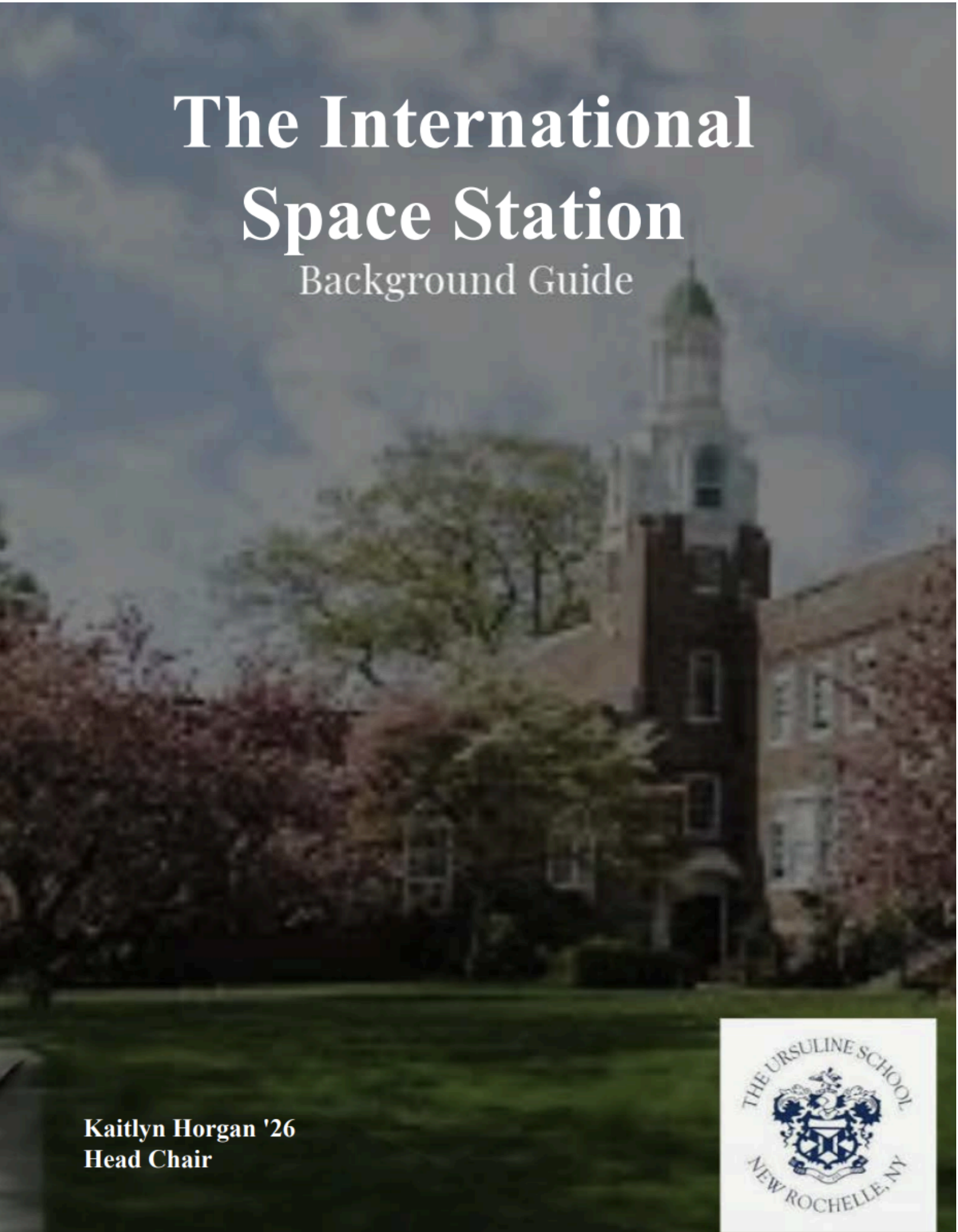
The International Space Station

Background Guide



Kaitlyn Horgan '26
Head Chair

THE URSULINE SCHOOL
NEW ROCHELLE, N.Y.

Table of Contents

Letter From Chair

Welcome Delegates,

My name is Kaitlyn Horgan, and I will be your head chair for the International Space Station! I am a senior and this is my second year chairing at TUSMUNC. Last year I was co-chair for the Olympics: The Future Ahead Committee. I am also the Charity Coordinator for the Ursuline Model UN Team. Outside of MUN I am involved in a multitude of clubs at Ursuline and love spending time with my family and friends. My favorite sports to play are golf and basketball and I love watching golf, basketball, and football! Please feel free to reach out with any questions and I am so excited to meet everyone at TUSMUNC VIII!

Kaitlyn Horgan ‘26 Head Chair

horgank2026@ursulinenewrochlle.org

Letter From Crisis

Welcome Delegates,

My name is Kaylie Souza, and I’m delighted to be your crisis director for Crisis on the ISS. This is my second year working as a crisis director for TUSMUNC, and I hope you’ll enjoy what I have planned for this committee! I love both space and crisis, so this is something of a dream for me. Outside of MUN, I follow motorsports, particularly WEC and Formula 1, and produce and write music for fun. If you have any questions about our committee, aspects of the ISS or space logistics you don’t quite understand, or about TUSMUNC in general, feel free to reach out to me. I look forward to seeing you all, and good luck!

Kaylie Souza ‘26 Crisis Director

souzak2026@ursulinenewrochelle.org

Background/Current Issues

The International Space Station (ISS) is widely recognized as one of the most ambitious human efforts to date, with its scientific research, state-of-the-art engineering, and unprecedented global collaboration. Occupied continuously since November 2000, the station is the collaborative effort of five space agencies: the United States' NASA, Russia's Roscosmos, the European Space Agency (ESA), the Japan Aerospace Exploration Agency (JAXA), and the Canadian Space Agency (CSA). Orbiting approximately 400 kilometers above the Earth and circling the planet every 90 minutes, the ISS functions as both a laboratory and a platform for preparing future missions beyond low Earth orbit.

The station does not operate as a single unit. Instead, it consists of a series of modules, each built, launched, and maintained by different nations. Roscosmos manages propulsion systems and the Zvezda module, ESA oversees the Columbus laboratory, and JAXA operates the Kibo experiment module, among others. This structure allows countries to share costs and expertise, but it also can create many challenges. Each nation keeps control over its own module, meaning astronauts effectively move between different countries' legal systems as they move through the station. While this works in day-to-day operations, crises can expose serious conflicts about which laws and procedures apply.

The multinational aspect of ISS also complicates communication and decision-making. Activities are coordinated at multiple mission control centers and time zones with several different languages and protocols. While this is not a problem during scheduled events such as resupply missions or scientific experiments, emergencies demand immediate response, and a delay

can be extremely dangerous. Fire, pressure loss, or a hazardous spill can kill the crew in a matter of minutes. If these incidents were to occur, a delayed or miscommunicated response could cost many lives.

Financial and political considerations also influence station operations. The ISS was constructed after the Cold War, where many nations encouraged and collaborated with each other, but now partners fund and manage their contributions slightly differently. NASA enjoys multi-year budgets allocated by the U.S. Congress, while Roscosmos has less predictable annual appropriations on the basis of political priorities. ESA and CSA must cope with balancing the needs of multiple member states. These variations mean that when things go awry with systems or launches are delayed, partners must also negotiate the technical solution and the financial burden. This can be time- and capital-intensive when both are in short supply.

The growing power of private enterprise has introduced an additional complication. Businesses such as SpaceX, Boeing, and Northrop Grumman now transport the crew and cargo, operating with their own hardware, software, and procedures. They have helped expedite processes at lower costs, but have also brought new risks. Proprietary technologies do not always reveal themselves fully to foreign partners, making things tricky in case of an accident. Questions of accountability also remain unsolved: in the event of a failure of a private spacecraft, is blame to be laid at the company, the country that approved the mission, or the international partners of the ISS? These issues refer to the tension between commercial innovation and multinational regulation.

The ISS also has to deal with issues resulting from their old hardware. The station was built to last fifteen years, but the

station has already been in service for more than two decades. An overuse of mechanics has created problems such as coolant leaks, electrical failures, and pressure anomalies in the air. Even though crews are equipped to make repairs, the most important spare parts are not onboard and must be launched from Earth, delaying them and keeping costs high. One system's failure, such as the failure of a water pump or the electrical power grid, can affect both survival and mission success. Such problems require coordination between agencies with different resources and procedures.

Despite such risks, the ISS continues to play an essential role in advancing space exploration. Long-term flights provide valuable data about physical and psychological effects of living in space. Research on microgravity, plant growth, human health, and radiation exposure paves the way for long term missions to the Moon, Mars, and elsewhere. The ISS also pays dividends on Earth as a contribution to climate science, disaster relief, mechanical innovations, and the study of medicine. It is therefore a shared space and a shared asset.

Now, the ISS is not only a hub of scientific study but an experimental platform for questions that will shape travel in space in the future. The growing involvement of private industry has resulted in worries over security, openness, and accountability. Its multinational composition has highlighted the need for effective emergency measures to overcome cultural and procedural differences, and the station’s laws emphasize the difficulty of delineating jurisdiction and sovereignty in outer space. Each of these challenges is a reflection of the general difficulty of sustaining international cooperation in a world where mistakes can be fatal. How the ISS adapts to these facts will set the benchmark for subsequent space endeavors.

Topic 1: Privatization and Security Risks in Low Earth Orbit

In the past decades, there has been a shift of private enterprises from marginal roles in space exploration to ones of essential importance. SpaceX, Boeing, and Blue Origin, amongst others, now provide cargo delivery, crew transport, and support infrastructure for low Earth orbit missions. Greater involvement has lowered costs, accelerated innovation, and diversified launch capability. At the same time, bringing in commercial actors into an international framework such as the ISS carries profound risks in terms of security, responsibility, and jurisdiction.

A prime example is SpaceX's Crew Dragon, which directly interfaces with ISS life-support, power, and navigation systems. While much of this partnership has added efficiency, it raises questions of command. When things go awry, blame may fall on company engineers, national space agencies, and the ISS partners themselves. Adding to the problem is that private systems are founded upon proprietary software which international partners have no access to.

Software updates are also relevant to cybersecurity. As orbiters further rely on automated docking, telemetry, and networked computer systems, they are increasingly exposed to cyberattacks. Satellites have already been hijacked through standard network protocols, and the same vulnerabilities threaten the ISS. An attack on docking or communications software could put both crew and hardware at risk, but the onus of prevention and response would rest with corporations, national governments, and international partners to coordinate uneasily.

Legal and regulatory frameworks further complicate the environment. While state actors have obligations under treaties such as the Outer Space Treaty and the ISS Intergovernmental Agreement, private

entities are primarily answerable to shareholders, insurers, and local regulators. This bifurcation creates uncertainty when something fails. A technical failure may create conflicts over liability, negligence, and criminal jurisdiction, with each party claiming competing legal obligations. Incidents in the past, such as Boeing's Starliner software errors, point out how small errors can send schedules and missions off track. Should these failures occur in orbit, the consequences would be immediate and severe.

Private actors' profit motives are also at stake. Efficiency is compelled by competition for contracts and future business; if corporations delay defect reporting to protect commercial reputations, international partners could lack information needed for successful operations.

Topic 2: Emergency Protocols for Multinational Crews

The International Space Station (ISS) is a prime example of global cooperation, with astronauts from multiple countries working together in a high-risk environment. Space emergencies are situations of utmost criticality where any decision could mean life and death, and crews that fly from various countries have an additional layer of complexity due to differences in training, commands, and agency procedures.

In space, disasters do not respect political borders: leaks, fires, or contamination may develop in more than one module, each operated by different governments. English as the working official language is used, but miscommunication often occurs under pressure. Incompatibility of command instructions between the ground control centers—e.g., NASA and Roscosmos—can create delays or authority disputes. Rotating command structures onboard are beneficial, but in emergencies, clear decisionmaking gets muddled.

Medical emergencies highlight these challenges. Officers aboard are given minimal training, but advanced treatment requires evacuation, something which can take hours or days. Treatment, transport, or priority choice can cause tensions between countries, especially if members' home countries are involved. Leaks of dangerous materials, like the 2021 chemical warning in the Russian module, also illustrate the difficulty of mobilizing rapid, multinational responses.

Since there are training differences, fire suppression, airlocks, and life-support maintenance procedures vary by module. System dependency is also common: American and Russian counterparts are dependent upon shared air flow, water recycling, and temperature control. Other crews may lack the clearance, knowledge, or

equipment to address a break in a foreign module's system.

Isolation and evacuation scenarios pose ethical and practical dilemmas. Quarantining a contaminated astronaut, isolating modules, or getting a seat on a small return vehicle require pre-agreed upon rules of who evacuates, who stays behind, and which nation's authority prevails. Private companies running escape vehicles introduce another complexity in terms of command and accountability.

In the end, ISS emergencies are as much a product of human choice and shared values as they are a function of technology. Procedures must stay ahead of crew risk, establish lines of authority, and enable cooperation on a multinational and multicontroller scale. As the station ages and space becomes increasingly more crowded and commercialized, so too will the risks. Without up-to-date, cohesive procedures, cooperation enabling the ISS could deteriorate in those moments when it is most necessary.

Topic 3: Sovereignty and Jurisdiction in Outer Space

The International Space Station is not just a research outpost in Earth's orbit—it's a unique political and legal experiment, floating in an area of space where no country has jurisdiction. Built and flown by several countries, the ISS itself is a neutral operation. Every module, astronaut, experiment, and emergency raises a central question: who really has authority in space?

According to international law, no country can own any part of outer space. The 1967 Outer Space Treaty, signed by the United States, Russia, and over one hundred other countries, declares that space shall be the "province of all mankind." But despite this idealistic language, practical questions remain unanswered.

One of the most complicated issues is jurisdiction. On Earth, jurisdiction is usually determined by territory. In space, there are no clear boundaries. According to current agreements, each country maintains legal jurisdiction over its own module and personnel. This means that American astronauts are subject to U.S. law, even when in orbit, while a Russian cosmonaut falls under Russian law.

But this creates complications. If an incident involves crew members from multiple countries, whose law applies? If a physical altercation happened between two astronauts—one American and one Russian—in the ESA module, would the European Space Agency have legal standing?

This problem isn't just hypothetical. In 2019, NASA investigated the first known allegation of a crime committed in space when an American astronaut was accused of improperly accessing the bank account of her spouse back on Earth, while aboard the ISS. The investigation concluded with no charges filed, but the case highlighted how

legal uncertainty in space can lead to confusion even in nonviolent situations.

Emergencies can worsen the situation. If a module needs to be sealed or if a crewmember must be restrained for safety reasons, can an astronaut from one country order another to act? What happens if a medical procedure must be performed against someone's wishes? In theory, agencies defer to mission control and station protocol. In practice, competing instructions, national interests, and legal obligations can interfere.

Beyond legal systems, sovereignty plays a larger symbolic and political role. Nations contribute to the ISS not only for science but also to assert their presence in space. As new countries join missions and private companies become involved, the question of control becomes more complicated.

Currently, the ISS functions through intergovernmental agreements, which are negotiated understandings between agencies that assign responsibility. These agreements were established in the late 1990s, before the emergence and interests of private spaceflight. The involvement of new countries also complicates the system. India, the United Arab Emirates, and other rising space powers seek access to orbital infrastructure. If they launch modules or send astronauts to international stations, they will want a role in decision-making. Adding new countries also means adding new legal systems and diplomatic tensions.

The ISS is also a symbol of geopolitics. In recent years, tensions between Russia and Western nations have strained cooperation. While the ISS has remained mostly insulated from political fallout, the risk of conflict is real.

The rise of private space companies makes this issue urgent. For instance,

SpaceX, Boeing, and Blue Origin already send spacecraft to the ISS and may operate their own stations in the future. If those facilities host astronauts from multiple countries or conduct joint missions, the question of legal authority will be just as important.

As humanity moves further into space, the limits of Earth-based legal systems will become more obvious. The ISS has managed so far because of trust, professionalism, and shared goals. But that balance is fragile. As the station ages, new players arrive, and emergencies grow more frequent, it will be critical to re-examine the legal frameworks that govern cooperation.

Questions to Consider

1) If the ISS loses communication with one nation's mission control during a technical failure, who steps in to make critical decisions in the meantime?
2) How should countries respond if a medical emergency occurs and there is no clear agreement on whose procedures take priority?
3) If a private company's software fails and causes damage to a shared system, who takes legal and/or financial responsibility for the failure?
4) What happens if two crew members from different countries disagree on how to handle a dangerous situation, and their agencies offer conflicting instructions?
5) Should there be a single set of emergency protocols that all space agencies follow, or is it more realistic for each country to keep its own rules?
6) In a crisis that affects multiple parts of the station, how do the crew decide which systems or modules to save first, especially when not all countries agree?
7) What are the risks of allowing private companies to manage transportation or life-support systems, and how can those risks be limited in a real emergency?
8) If a crew member is accused of corruption, or poor conduct, while in space, what legal system handles the situation, and how would an investigation actually work aboard the ISS?

Positions

Bill Nelson

Bill Nelson is the Administrator of NASA and one of the most important leaders in American space policy. A former U.S. senator and astronaut, he was appointed to lead NASA in 2021. Nelson has played a key role in strengthening U.S. space cooperation and expanding public-private partnerships. He oversees major NASA programs, including the International Space Station, and works closely with other national and international space agencies.

Pam Melroy

Pam Melroy is the Deputy Administrator of NASA. A retired astronaut and U.S. Air Force colonel, she has flown three space missions and is one of only two women to ever command a space shuttle. She assists with executive decision-making across NASA's directorates and works directly under the Administrator on strategic policy, particularly with regard to safety and interagency coordination.

Bale Dalton

Bale Dalton is the Chief of Staff at NASA. He supports senior leadership and acts as a key advisor on interdepartmental strategy. With graduate degrees in public policy and business administration, he helps manage NASA's internal operations and communications across different directorates. Dalton plays a critical role in aligning policy goals with typical day-to-day logistics.

Thomas E. Cremins

Thomas Cremins serves as the Associate Administrator for Space Security Interests at NASA. With a background in defense policy and strategic operations, he focuses on national security concerns related to space assets. He also advises on emerging threats, including cyberattacks and interference with satellite infrastructure.

James Free

James Free is NASA's Associate Administrator for the Mission Directorates. He oversees all major mission areas, including space technology, exploration, and science. He acts as a bridge between NASA's leadership and the technical arms of the agency, making decisions that directly affect station operations and international partnerships.

Dr. Kurt Vogel

Dr. Kurt Vogel, known by the nickname "Spuds," leads the Space Technology Mission Directorate. His team develops new technologies for future missions and station upgrades. He is responsible for managing innovation and ensuring that NASA continues to lead in research and development for deep space exploration.

Dr. Nicola Fox

Dr. Nicola Fox leads NASA's Science Mission Directorate. She holds a Ph.D. in space and atmospheric physics and oversees scientific programs including Earth science, planetary science, and astrophysics. She helps ensure that research aboard the ISS aligns with long-term scientific goals.

Catherine Koerner

Catherine Koerner is the head of NASA's Exploration Systems Development Mission Directorate. With a background in aeronautical engineering, she leads projects related to spaceflight architecture, system integration, and future transport technologies. She coordinates between mission planning and hardware execution.

Commander Elena Markovic

Commander Elena Markovic is the current commander of the ISS, representing the European Space Agency. She is a veteran astronaut with experience on multiple long-duration missions. She is known for her calm leadership and technical precision. She manages the station's daily operations and enforces crew discipline during emergencies.

Dr. Lucas Grant

Dr. Lucas Grant is a flight engineer representing NASA aboard the ISS. He specializes in mechanical and electrical systems and is responsible for maintaining some of the most critical hardware during emergencies. He is known for advocating detailed risk assessments and strict adherence to U.S. spaceflight protocols.

Dr. Reiko Tanaka

Dr. Reiko Tanaka is a medical officer representing JAXA. She is trained in aerospace medicine and emergency triage response. Onboard, she monitors the crew's health and oversees protocols for medical isolation. She also plays a key role in bridging cultural differences through calm and effective communication.

Dmitri Sokolov

Dmitri Sokolov is a life support systems engineer representing Roscosmos. He is an expert on Russian-built environmental systems aboard the ISS and is known for his blunt, technically focused approach to problem solving. He is outspoken about maintaining Russia's independence in onboard operations.

Dr. Anya Kowalski

Dr. Anya Kowalski serves as the communications and data systems officer for the Canadian Space Agency. She handles the ISS's network diagnostics and satellite uplinks. She previously worked in cybersecurity and is fluent in English, French, and Russian. Her technical expertise makes her a key figure in cyber risk management.

Valentina Chavez

Valentina Chavez is a NASA flight director based in Houston. She is responsible for real-time decision-making and coordination between the ISS and ground support. Known for her composure during past technical anomalies, she manages the distribution of shared station resources across national teams.

Lev Petrov

Lev Petrov is a flight controller from Roscosmos working out of Moscow. He advocates for firm Russian control over their modules and often voices concern over the influence of private companies. He is deeply protective of Russian assets and supports operational separation during disputes.

Isabelle Moreau

Isabelle Moreau is a European Space Agency liaison officer based in Cologne, Germany. She is known for her diplomatic skills and ability to manage negotiations between space agencies. She supports European autonomy in space policy while also promoting collaboration aboard the ISS.

Akira Fujimoto

Akira Fujimoto is a mission planner for JAXA. He leads the planning of Japanese research projects and is an expert in robotics and the operation of Japan's laboratory module. He is respected for his calm demeanor and detailed knowledge of onboard logistics.

Raj Malhotra

Raj Malhotra is an orbital operations expert from the Indian Space Research Organisation. He was recently assigned to a multinational safety initiative and monitors threats to the ISS orbit. He also advocates for greater representation of emerging space nations in station decision-making.

Jessica Wang

Jessica Wang is the Starliner Integration Officer at Boeing. She works on docking protocols and technical systems related to the Starliner spacecraft. Frustrated with production delays, she supports more rigorous testing standards across all ISS transport systems.

Dr. Sofia El-Sayed

Dr. Sofia El-Sayed is a space policy advisor for the United Nations Office for Outer Space Affairs. She specializes in international space law and is responsible for monitoring treaty

compliance aboard the ISS. Her role includes mediating disputes between national agencies and promoting peaceful cooperation.

Lieutenant Gen. Maria Rodriguez

Lieutenant Gen. Maria Rodriguez is a space policy analyst with the U.S. State Department. She advises on how ISS-related actions may affect international relations. She is especially focused on maintaining American interests and often questions the reliability of long-term partners like Roscosmos.

Amb. Yulia Ivanovna

Ambassador Yulia Ivanovna is a diplomatic attaché representing the Russian Federation. She is a vocal defender of Russia's control over its station modules and often clashes with Western representatives over the direction of ISS operations. She plays a key role in international negotiations during high-tension moments.

Dr. Helena Adebayo

Dr. Helena Adebayo is the Red Cross humanitarian liaison to the ISS. She monitors ethical protocols and crew rights during emergencies. She ensures that non-governmental standards are followed, particularly in relation to medical treatment, isolation, and mental health.

Dr. Mei Lin

Dr. Mei Lin is a medical advisor with the World Health Organization. She provides expertise on spaceborne illnesses, contamination risk, and long-term isolation. She also works to integrate global health protocols with on-orbit procedures.

Noah Stein

Noah Stein is NASA's media and public communications officer. He manages messaging between the ISS and the public, especially during times of uncertainty. Stein is responsible for maintaining transparency while preventing public panic.

Khadija Rahmani

Khadija Rahmani is the ISS's lead engineer for AI and robotics systems. She monitors the station's autonomous tools and responses. She is concerned with ensuring AI safety and identifying potential malfunctions or manipulation during high-stakes scenarios.

Works Cited

1. NASA. *International Space Station: Facts and Figures*. NASA, 2024, https://www.nasa.gov/mission_pages/station/facts-and-figures.html.
2. European Space Agency. *Living and Working on the International Space Station*. ESA, 2023, https://www.esa.int/Science_Exploration/Human_and_Robotic_Exploration/International_Space_Station.
3. Roscosmos. *ISS Partnership and Module Operations*. Roscosmos, 2023, https://www.roscosmos.ru/.
4. United Nations Office for Outer Space Affairs (UNOOSA). *Space Law: Treaties and Principles*. UNOOSA, 2024, https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties.html.
5. SpaceX. *Crew Dragon Overview*. SpaceX, 2024, https://www.spacex.com/vehicles/dragon/.
6. Boeing. *Starliner Spacecraft*. Boeing, 2023, https://www.boeing.com/space/starliner/.
7. Canadian Space Agency. *CSA Astronauts and ISS Contributions*. Government of Canada, 2024, https://www.asc-csa.gc.ca/eng/astronauts/default.asp.
8. JAXA. *Japanese Experiment Module "Kibo" and ISS Roles*. Japan Aerospace Exploration Agency, 2023, https://global.jaxa.jp/projects/iss_human/index.html.
9. "Meet the ISS Crew and Ground Teams." *Scientific American*, 2022, https://www.scientificamerican.com/article/meet-the-iss-crew-and-ground-teams/.
10. Pelton, Joseph N. *Space and the Law: Future Challenges*. Springer, 2020.
11. NASA. *"Bill Nelson: Administrator." NASA*, 2024, https://www.nasa.gov/people/bill-nelson/.
12. NASA. *"Pam Melroy: Deputy Administrator." NASA*, 2024, https://www.nasa.gov/people/nasa-deputy-administrator-pam-melroy/.
13. NASA. *"Bale Dalton: Chief of Staff." NASA*, 2024, https://www.nasa.gov/people/nasa-chief-of-staff-bale-dalton/.
14. NASA. *"Thomas E. Cremins: Associate Administrator for Space Security Interests." NASA*, 2024, https://www.nasa.gov/people/nasa-associate-administrator-for-space-security-interests-thomas-e-cremins/.
15. NASA. *"James Free: Associate Administrator for Mission Directorates." NASA*, 2024, https://www.nasa.gov/people/james-free-2/.
16. NASA. *"Dr. Kurt Vogel: Associate Administrator, Space Technology." NASA*, 2024, https://www.nasa.gov/people/dr-kurt-vogel-associate-administrator-space-technology/.
17. NASA. *"Kenneth Bowersox: Associate Administrator, Space Operations." NASA*, 2024, https://www.nasa.gov/people/kenneth-bowersox/.
18. NASA. *"Nicola Fox: Associate Administrator, Science Mission Directorate." NASA*, 2024, https://www.nasa.gov/people/nicola-fox/.

19. NASA. *"Robert A. Pearce: Aeronautics Research Mission Directorate." NASA*, 2024, https://www.nasa.gov/people/robert-a-pearce/.

20. NASA. *"Catherine Koerner: Exploration Systems Development." NASA*, 2024, https://www.nasa.gov/people/catherine-koerner-associate-administrator-for-exploration-systems-development/.

21. European Space Agency. *Living and Working on the International Space Station. ESA*, 2023, https://www.esa.int/Science_Exploration/Human_and_Robotic_Exploration/International_Space_Station.

22. Japan Aerospace Exploration Agency. *"Kibo: ISS Japanese Experiment Module." JAXA*, 2024, https://global.jaxa.jp/projects/iss_human/index.html.

23. *The Outer Space Treaty*. United Nations Office for Outer Space Affairs, 1967, https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introouterspacetreaty.html.

24. Matyushin, Maxim, and Olga Smirnova. *"The ISS Crew Onboard Safety Actions." Rocket Space Corp "Energia"*, AIAA, 2010, https://www.opsjournal.org/DocumentLibrary/Uploads/ISS_Crew_Safety.pdf.

25. Vanderhoef, John W., and Megan K. Knowles. *"Safety Protocols, Precautions, and Countermeasures Aboard the ISS to Prevent Ocular Injury." Journal Pre-proof via ResearchGate*, 25 July 2024, https://www.researchgate.net/publication/383716109_Safety_protocols_precautions_and_countermeasures_aboard_the_International_Space_Station_ISS_to_prevent_ocular_injury.

26. Dvorsky, George. *"The Privatization of Space: When Things Go Wrong." GCSP*, 2015, https://www.gcsp.ch/news/privatization-space-when-things-go-wrong.

27. Waxman, Henry, et al. *"One-Way Ticket to Mars: The Privatization of the Space Industry and ..." Northwestern Journal of Law and Social Policy*, 2023, https://scholarlycommons.law.northwestern.edu/cgi/viewcontent.cgi?article=1248&context=njlsp.

28. *International Space Law. Space Foundation*, 2024, https://www.spacefoundation.org/space_brief/international-space-law/.

29. *"Privatizing the ISS: International Complications." The Space Review*, 2003, https://www.thespacereview.com/article/145/1.

30. Singh, Leena. *"Security, Sovereignty, and Jurisdiction in Space Law." iPleaders*, 2021, https://blog.ipleaders.in/sovereignty-jurisdiction-space-law/.

31. Smith, Jess S. *"Sovereignty Versus Space: Public Law and Private Launch in the Space Age." University of Nebraska DigitalCommons*, 2019, https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1000&context=spacelaw.

32. Brown, Jennifer. *"Cybersecurity in Space: The Final Frontier." Chatham House*, 2016, https://www.chathamhouse.org/2016/09/space-final-frontier-cybersecurity-0/3-threats-risks-and-trends.

33. Green, Natalie. *"High-Risk Private Space Missions and Public Perception." Nature Astronomy*, June 2025, https://www.nature.com/articles/s41526-025-00474-z.

34. Johnson, Mark. *"Design and Analysis of Emergency Protection Scheme for Manned ISS Missions." ScienceDirect*, 2022, https://www.sciencedirect.com/science/article/abs/pii/S0273117722005440.

35. Green, Susan. *"Issues in Life Support and Human Factors in Crew Rescue from the ISS." NASA Technical Report Server*, 2004, https://ntrs.nasa.gov/citations/20040088685.

36. Roberts, Claire. *"Emergency CPR During Spaceflight Missions." BMC Emergency Medicine*, 2020, https://sjtrem.biomedcentral.com/articles/10.1186/s13049-020-00793-y.

37. Lee, Vincent. *"Human Factors Assessment of ISS Medical Packs." SAGE Journals*, 2005, https://journals.sagepub.com/doi/10.1177/154193120504900102.

38. Global Arbitration Review. *"Navigating the Legal Cosmos of Space Disputes."* *GAR*, 2024, https://globalarbitrationreview.com/guide/the-guide-aviation-and-space-disputes/first-edition/article/navigating-the-legal-cosmos-of-space-disputes-sources-of-space-law-and-core-principles.

39. Time Magazine. *"3 Reasons Trump's Plan to Privatize the ISS Won't (and Shouldn't) Happen." Time*, 11 Feb. 2018.

40. Wired. *"Who's Going to Buy the International Space Station?" Wired*, 2018, https://www.wired.com/story/whos-going-to-buy-the-international-space-station.

41. Wired. *"NASA Went to the Stock Exchange to Try to Sell the ISS." Wired*, 2018, https://www.wired.com/story/nasa-went-to-the-stock-exchange-to-try-to-sell-the-iss.

42. Oxford Public International Law. *"Space Law." OPIL*, 2023, https://opil.ouplaw.com/display/10.1093/law-epil/9780199231690/law-9780199231690-e2246.

43. Proelium Law LLP. *"International Space Law Regulations, Challenges and the Need for Stronger Cooperation."* 2025, https://proeliumlaw.com/international-space-law-regulations-challenges-and-the-need-for-stronger-international-cooperation/.

44. Cutter Consortium. *"Cybersecurity Challenges in Space Exploration." Cutter*, 2024, https://www.cutter.com/article/cybersecurity-challenges-space-exploration.

45. NASA. *"Crew Medical Treatment Algorithms for the ISS." PMC*, 2015, https://pmc.ncbi.nlm.nih.gov/articles/PMC9283715/.

46. ResearchGate. *"Safety Protocols, Precautions, and Countermeasures Aboard the ISS to Prevent Ocular Injury."* 2024, https://www.researchgate.net/publication/383716109_Safety_protocols_precautions_and_countermeasures_aboard_the_International_Space_Station_ISS_to_prevent_ocular_injury.

47. Northwestern Journal of Law and Social Policy. *"Privatization of the Space Industry."* 2023, https://scholarlycommons.law.northwestern.edu/cgi/viewcontent.cgi?article=1248&context=njlsp.

48. *Outer Space Treaty and Protocols*. United Nations, UNOOSA, 1967.
49. NASA. "Dr. Kurt Vogel – Associate Administrator for Space Technology." *NASA*, 16 July 2024, web.archive.org/web/20240716225420/https://www.nasa.gov/people/dr-kurt-vogel-associate-administrator-space-technology/.
50. NASA. "Kenneth Bowersox." *NASA*, 4 Apr. 2024, web.archive.org/web/20240404225615/https://www.nasa.gov/people/kenneth-bowersox/.
51. NASA. "Nicola Fox." *NASA*, 17 July 2024, web.archive.org/web/20240717031901/https://www.nasa.gov/people/nicola-fox/.
52. NASA. "Robert A. Pearce." *NASA*, 28 May 2024, web.archive.org/web/20240528101825/https://www.nasa.gov/people/robert-a-pearce/.
53. NASA. "Catherine Koerner – Associate Administrator for Exploration Systems Development." *NASA*, 4 Apr. 2024,

    web.archive.org/web/20240404225713/https://www.nasa.gov/people/catherine-koerner-associate-administrator-for-exploration-systems-development/.

54. NASA. "Pam Melroy – NASA Deputy Administrator." *NASA*, 16 May 2024, web.archive.org/web/20240516102818/https://www.nasa.gov/people/nasa-deputy-administrator-pam-melroy/.
55. NASA. "Bale Dalton – NASA Chief of Staff." *NASA*, 15 Apr. 2024, web.archive.org/web/20240415124725/https://www.nasa.gov/people/nasa-chief-of-staff-bale-dalton/.
56. NASA. "Thomas E. Cremins – NASA Associate Administrator for Space Security Interests." *NASA*, 17 Apr. 2024,

    web.archive.org/web/20240417151258/https://www.nasa.gov/people/nasa-associate-administrator-for-space-security-interests-thomas-e-cremins/.
57. NASA. "James Free." *NASA*, 16 May 2024, web.archive.org/web/20240516190708/https://www.nasa.gov/people/james-free-2/.