Space Law Then, Now, and in the Future: A Conversation with Pamela Meredith and Laura Montgomery

The Air & Space Lawyer recently hosted a roundtable conversation with two of the nation's leading space law practitioners, Pamela Meredith and Laura Montgomery. Ms. Meredith is Chair of the Space Law Practice Group at Zuckert, Scoutt & Rasenberger L.L.P. in Washington, D.C.; she also is an adjunct professor of satellite communications and space law at American University's Washington College of Law. Ms. Montgomery is an attorney and the proprietor of Ground Based Space Matters, a space-focused consulting and law firm; she also is an adjunct professor of space law at Catholic University's Columbus School of Law. She spent over two decades with the Federal Aviation Administration (FAA), where she served as the manager of the Space Law Branch in the FAA's Office of the Chief Counsel. Their interlocutors were Jeff Klang, Senior Counselor for the FAA's International Office and a member of the editorial board of *The Air & Space Lawyer*; and Taria Barron, Attorney Advisor at the Consumer Financial Protection Bureau and a former attorney in the FAA's Office of the Chief Counsel. The meeting, appropriately for a discussion about space law, occurred at the FAA's offices at 600 Independence Avenue, which used to be NASA's headquarters. The following is an edited and condensed version of the conversation.

A&SL: Pamela, please tell us about your background and how you came to practice in the area of space law.

Pamela Meredith (PM): I attended law school in my home country of Norway, then moved to Montreal where I received a master's degree in air and space law at McGill University's Institute of Air & Space Law in the early 1980s. During the last semester, I visited Washington, D.C., to research a thesis paper. I remember that when I arrived it was a gorgeous day in May and the city looked beautiful. I decided that this is the place where I wanted to be. I was fortunate to get a job here with a small firm working with a space law practitioner, and that started my career in practice as a space lawyer.

A&SL: In addition to being a space law practitioner, you are a law professor.

PM: Yes, and in fact, Jeff (Klang), you were my student in the spring semester of 1989. That was the first course I taught at American University's law school, and I've been teaching space law there ever since.

A&SL: Laura, please tell us about your background and how you came to be a space lawyer.

Laura Montgomery (LM): I started reading science fiction at age 13, but do not have a STEM brain, so I decided that law was for me. I was interested in space law from the start. I was fortunate to join a law firm here in Washington, D.C., that did satellite work and also handled black lung cases. Both of those areas of practice involved administrative law, which has been extremely useful given the regulatory nature of space law. When I interviewed for a position at the Department of Transportation, I believe that I got the job because after my interview I visited the National Air and Space Museum and touched the Moon rock for good luck. It worked.

A&SL: Who were some of the individuals who influenced and shaped your career?

LM: Robert Heinlein, the science fiction author, influenced many engineers and space specialists, including me. When I started in legal practice, Laura Klaus was a very meticulous legal practitioner who taught me to focus on text and language and that each word has significance, which was influential in terms of the development of my legal and analytical skills. I subsequently joined the FAA and worked with Patti Grace Smith, who recently passed. Although she was not a lawyer, I learned a lot about leadership from her. She was a shining example of that: an incredibly savvy woman blessed with great instincts and common sense.

A&SL: Pamela, who were your biggest influences?

PM: My first introduction to space law occurred in the 1970s when my international law professor in Norway took me to an international law conference in Belgrade in the former Yugoslavia, where I met the leaders of McGill University's Institute of Air & Space Law. Martine Rothblatt, who had left another Washington, D.C., firm in 1982 to start a space law practice, offered me my first job and was a great mentor and influence on my career. Finally, Dr. George Robinson, who was Associate General Counsel at the Smithsonian, was also a great influence. He had been at NASA and had a strong interest in space law. We authored a book together, *Space Law: A Case Study for the Practitioner*, in the 1990s.

A&SL: Laura, what were the big issues in space law 20 years ago?

LM: During the 1990s, there was intense interest in space launch vehicles and rockets, with many

companies seeking to send up satellite constellations, meaning not just one satellite but a group of them. With geostationary and low Earth orbit satellites, the launch industry realized that expendable launch vehicles (ELVs) could be commercially viable. This was also after the *Challenger* accident, at a time when there was no more commercial activity on the space shuttle, which had forced industry to pivot back to ELVs. The Air Force also was very interested in fostering at least two ELVs so that there would be some competition. ELV companies, meanwhile, were attracted by the prospect of a market where not only the government but also commercial satellite operators would be their customers. This created considerable optimism about the industry's commercial prospects and led to a significant infusion of capital in both satellite operators and the launch industry.

A&SL: What was the FAA's regulatory focus with respect to space at that time?

LM: For the FAA, it was a time of great regulatory activity. We had previously relied so heavily on the Air Force for safety that the safety standards were rather nontransparent. The FAA sought to address this by publishing and codifying regulations. Not surprisingly, these regulations were similar to the Air Force's practices and procedures. The FAA promulgated the so-called "launch rule" or core regulations governing launch vehicles. It took nine years to finalize those regulations.

A&SL: Pamela, what were the big issues in space law 20–30 years ago from your perspective?

PM: During the 1980s, satellite communications regulation was the major space law practice area. The Federal Communications Commission (FCC) began to regulate private satellite communications companies in the 1970s using the Communications Act, a law that was enacted in 1934. The FCC determined that since it had jurisdiction under the Act to regulate "radio stations," it could regulate communications satellites because they are radio stations. It didn't matter that they were in space. Around 1970, the FCC issued the first license to a private company to construct, launch, and operate a satellite, which was Western Union's satellite. In fact, ABC, the television network, was the first company to apply for a license to use a satellite to distribute programming to its affiliates around the country. Ultimately, however, ABC did not pursue it. (COMSAT, a statutory creation, had been authorized in the 1960s to operate satellites for INTELSAT, which was then an international organization.) Accordingly, my space law work in the early years centered on communications satellite licensing and rulemakings. My work subsequently evolved to launch-related matters after the enactment in 1984 of the Commercial Space Launch Act, which raised some challenging legal issues, particularly as the FAA promulgated regulations to implement the Act, as Laura mentioned. When satellite remote sensing was commercialized in the mid-1980s and again with the Land Remote Sensing Policy Act in 1992, this became a new and interesting practice area for me. The increased private sector involvement in space activities also opened up an increasing amount of transactional work, and my practice shifted in that direction. The breakup of the Soviet Union and the creation of new East-West ventures, such as the satellite launch venture Sea Launch, contributed greatly to my space law practice.

A&SL: Moving forward to the twenty-first century and through today, what do you view as the significant issues over the past decade plus and currently?

PM: The new millennium has seen the introduction of human space flight legislation (2004) and a new statute endorsing commercial extraction of resources from asteroids and the Moon and the ownership of those resources (2015). My work in the area of human spaceflight has revolved around risk and liability facing companies that contribute hardware to such missions. The big issue going forward is whether and how to regulate resource extraction and other new space activities.

LM: The concept of space law has evolved from a rather academic focus on international treaties (dating back to the 1960s and 1970s) to the later emergence of national or domestic space laws. In the United States, this includes the regulatory roles and activities of the FAA, the FCC, and the National Oceanic and Atmospheric Administration (NOAA). As the focus has started to shift from expendable to reusable rockets, companies like SpaceX and Blue Origin are leading the way and hopefully will make space more accessible from an operational and cost perspective. Orbital debris, however, remains a significant and increasing concern. I was proud that the FAA was the first regulatory agency to issue debris rules, and the private sector is also attempting to address the problem (e.g., through the Space Data Association), which is appropriate because it is their property that would get destroyed if a collision occurs. This is an area in which greater dialogue and coordination is essential to address the problem.

A&SL: What are the likely issues of the future?

LM: Looking to a future of people traveling to the Moon and Mars, property rights issues are likely to become critical, both with respect to moveable property and real property issues. In 2015, Congress recognized that space miners have property rights in the resources they extract. Congress did not, however, address questions regarding private ownership of land. Many academics think that the Outer Space Treaty prohibits private ownership of real property, but I do not agree. That question, however, is a live issue.

A&SL: How commercially viable is space mining?

PM: At least two companies, Deep Space Industries and Planetary Resources, have plans to mine asteroids

using robots. The Space Resource Exploration and Utilization Act was enacted in 2015 to allow private companies to extract, own, and sell whatever they extract from an asteroid or planetary body. Resolving issues of legality surrounding such mining was critical to obtaining investment for these projects. The United States must now convince other nations that this legislation is consistent with the Outer Space Treaty's nonappropriation clause.

A&SL: How is human space flight regulated?

LM: The Commercial Space Launch Amendments Act of 2004 clarified the FAA's regulatory authority over human space flight. This authority encompasses launch and reentry, but the FAA does not regulate space travel, time spent in orbit or between planets. The 2004 Act included an eight-year moratorium on regulation to protect the safety of people on board, which has now been extended to 2023. Rather than guaranteeing safety, the law requires informed consent, meaning that the operator must tell you that space travel is an inherently dangerous activity and that you could be seriously injured or die. It's an interesting piece of legislation because, by limiting the FAA's authority, it afforded space operators the same regulatory freedom that the fledgling civil aviation industry enjoyed, as a means of promoting innovation, experimentation, and technological development. This of course involves an inevitable degree of risk that the government cannot at this juncture eliminate by legislation.

A&SL: So it's space travel at your own risk.

LM: Exactly. We let people jump out of airplanes, climb really high mountains, and smoke cigarettes. Some states have repealed motorcycle helmet safety laws. So if you can ride around on a motorcycle with your hair blowing in the wind, you can get on a rocket if you want to, if that's your life's dream.

A&SL: Would you want to travel to space?

LM: I go back and forth, but if I reach the age of 95 and have had a lovely long life, it would be pretty cool to give it a shot.

PM: Maybe it will be safer by then, but nothing would persuade me to do it today. I'm unfortunately too well informed about those risks. I just don't have that desire and never really had it.

A&SL: What are your thoughts about NASA's retrenchment from the space shuttle program and the United States' increasing reliance on other countries, including Russia, to access the space station?

LM: I wouldn't presume to second guess the decision to retire the shuttle. There were probably good reasons for that. However, it would obviously be better if there was a U.S. company serving the space station rather than relying on Russian rockets for human space flight, which is what we are doing now. Boeing, SpaceX, Orbital ATK, Sierra Nevada, and Blue Origin are all developing their own technology, and SpaceX and Orbital resupply the space station with cargo. Now the question is whether they'll be able to take up astronauts. NASA is encouraging and facilitating that.

PM: I agree with Laura. The problem is that we are not accelerating funding to make this happen quickly. We do not have the capability today, so we pay the Russians a fortune to take our astronauts to the space station, which is really a shame. NASA has contracted with SpaceX and Boeing to develop vehicles to ferry astronauts to and from the space station, but these contracts are not being adequately funded.

A&SL: What do you view as the most significant developments with regard to international commercial space law?

PM: Space law is inherently international. There are five United Nations space treaties: the Outer Space Treaty, the Rescue and Return Agreement, the Liability Convention, the Registration Convention, and the Moon Treaty. Neither the United States nor any other major spacefaring country is a party to the Moon Treaty. In addition, there are all the treaties relating to the work of the International Telecommunication Union (ITU). This organization is important because it presides over the allocation of radio frequency spectrum for satellites and registers frequency assignments made by member states to satellite operators—all for the critical purpose of avoiding harmful radio interference.

A&SL: How do the United States' space laws differ from those of other countries?

PM: The United States has by far the most advanced body of domestic space law. Other countries, such as the United Kingdom, France, and Australia, also have space statutes on their books. Those countries have tended to take an umbrella approach, with a single statute that governs licensing of a variety of space activities, whereas the United States has several statutes, which address different types of activities, e.g., satellite communications, space transportation, and satellite remote sensing. Foreign countries have borrowed from our domestic space law. For example, we require participants in space launches to sign liability waivers, and this approach has been adopted by several foreign space law regimes. More and more countries are now enacting space statutes to support their domestic space programs or emerging space industries. The United Arab Emirates is a recent example.

A&SL: Can you describe the coordination and collaboration among nations in the space law area, for example with respect to the International Space Station?

LM: While I was at the FAA, we hosted visitors from other countries, including the United Kingdom, Japan, and France, who wanted to discuss our space laws, how we implemented them and how they work. Some of them were interested in using our system, or at least

the parts they liked, as a model. So there was a continuing dialogue with these other countries about space law issues, but it never reached a point where we discussed interoperability with respect to the space station, which was outside the FAA's jurisdiction in any event.

PM: When the Soviet Union collapsed, U.S. companies started collaborating with Russian companies that were in possession of launch technology because the Russians were able to launch at less cost than Western counterparts. Some very remarkable joint ventures emerged. Laura and I both worked with Sea Launch, which was a joint venture of Boeing; Yuzhnoye, of Ukraine; Energia, of Russia; and Kvaerner, a Norwegian company. The idea was to launch satellites from a converted oil platform, located near Kiribati, in the South Pacific, close to the equator, which is advantageous for geostationary satellite launches. That was a spectacular joint venture among U.S. and foreign companies. They applied to the FAA (i.e., Laura) for a launch license, and I had the opportunity to advise them on some issues.

LM: That's how Pamela and I met. We had to decide whether this entity needed an FAA license based on Boeing's role. We concluded that it did, based on the statute.

A&SL: What is the relationship between government lawyers, private practitioners, private industry, and academics in the space law area? Does that diversity of perspectives enhance creative analysis and problem solving?

LM: We are collegial. We all get along and we discuss our issues extensively. Pamela and I will sit at a conference and talk about cross-waivers. Yes, we are geeks!

PM: For example, remember the high-altitude balloon intended to take tourists closer to the edge of space (the airspace-space boundary has not been legally defined)? We worked together on that one. The FAA ultimately determined (thanks to Laura) that the manned gondola tethered beneath a high-altitude balloon, using advanced stratospheric balloon technology, qualified as a "launch vehicle" because it was "built to operate in space," a criterion that placed the balloon venture under the jurisdiction of the FAA's space office rather than the FAA's traditional balloon regulations. Those regulations had not been changed in decades, and applying them here would have put an end to this high-tech balloon venture.

LM: The balloon didn't fit under the aviation balloon regulations for a variety of reasons. We determined that it could fit under the space regulations. It would operate at ultra-high altitudes, so high that you could see the curvature of the Earth. It wouldn't be possible for a person to survive without environmentally controlled life support technology, similar to what is used on the space station. For me, the project was thrilling because I thought "we're finally going to define outer space," but that did not happen. Instead, we devised a different legal theory that the balloon was a launch vehicle, which was consistent with the statute (as it should be). The rationale was that if you operate at this ultra-high altitude and need to have life support equipment to keep people alive while in orbit, then we can call you a launch vehicle. Therefore, as a regulatory matter, the balloon was subject to regulation by the space side rather than the aviation side of the FAA. Pamela and I worked closely together on that project. So I think there really is a high degree of collegiality and interchange between government and the private sector and of course also the academic community.

A&SL: As you have noted, space law—or more specifically satellites—are subject to regulation by multiple agencies, including the FAA and the FCC. Have these overlapping regulatory regimes impeded progress? Would it be better if Congress conferred exclusive authority on a single agency?

LM: I don't think so. Congress has decided that rockets are vehicles with a high explosive yield. They are highly dangerous to people on the ground. The safety system for these rockets is to blow them up over the ocean. It's an inherently dangerous transportation activity. It needs to be regulated by agencies with relevant expertise. If different agencies can bring to bear different expertise to enhance regulatory oversight, so much the better.

PM: I agree. It is important that the regulatory agency have the necessary resources and expertise. We are at a crossroads in space regulation at present because some of the new, proposed space activities don't fit neatly within the traditional regulatory sphere of a given agency. For example, where does mining an asteroid fit among the traditional regulatory bodies? Asteroid mining involves communication, which the FCC regulates, but it also involves other activities, such as the rendezvous, docking, and resource extraction processes. This has been an issue of considerable debate. Congress has been holding hearings (at which Laura has testified) as to whether and how we should regulate new activities and whether we need a new agency to do so.

A&SL: What is the responsibility of the United States and other nations to regulate the activities of their companies and citizens in space?

LM: Pamela and I disagree on this, but there's a provision in the Outer Space Treaty, Article VI, which says that each country must supervise and authorize the activities of its nongovernmental entities. This is not a self-executing provision, and the U.S. Supreme Court has held that a non-self-executing treaty is not domestically enforceable. This means that if someone wants to go play the harp on the Moon or brush her teeth in outer space, she doesn't need a license. I use these frivolous examples intentionally to make the point that everything doesn't need to be regulated just because you're in outer space. The FAA has taken a different approach. Of

course, Congress may intervene and decide that regulation is required. I very much hope they don't follow the previous administration's approach, which proposed to regulate everything in space. Instead, Congress should fulfill its Article VI obligations by first deciding whether an activity is dangerous or a national security problem before requiring regulation. Mining is the perfect example of where this kind of rational analysis is required. On Earth, mining is dangerous. You can have cave-ins, noxious fumes, environmental issues, landslides, mudslides, Buffalo Creek disasters. But in space you have robots on asteroids very far away from everyone else. How much regulation should that need? If you bring the asteroid back to Earth, that would require some safety oversight, but until then . . .

PM: I disagree with Laura on this. Article VI of the Outer Space Treaty provides that all state parties to the treaty are responsible for their activities in outer space, whether they're carried out by government agencies or private companies. Countries are required to subject private companies within their jurisdiction that engage in space activities to an authorization requirement and continuing supervision. So, the United States is responsible for compliance with the Outer Space Treaty by our private companies or entities that go into space. Take the asteroid mining scenario. If someone proposes to mine an asteroid or the Moon, we should regulate that activity, for example, to prevent contamination of these celestial bodies (which is an obligation under the treaty) and also back-contamination on Earth (if anything is brought back to Earth). We need to ensure that the activity is safe and that it complies with the treaty.

A&SL: Are there other emerging legal issues and challenges in space and commercial space?

LM: Pamela just raised an important issue: planetary protection. Article IX of the Outer Space Treaty of 1967 requires state parties to avoid harmful contamination of space, but what does that mean? I think that there needs to be a policy debate in Congress as to whether the planetary protection obligation will prohibit human settlement, human visitors to other planets. I don't believe that was the original intent of that provision of the treaty, which in any event on its face only applies to state activities, and is not self-executing.

A&SL: We all recall the space race of the 1960s between the United States and the Soviet Union. Are we seeing a new "race for space" today?

PM: The space race of the 1960s was a contest between the United States and the USSR. Today, other countries such as China and India have entered the space arena. China in particular has great ambitions in space and is investing a lot of money. Will they one day plant the red flag on the red planet? How would the United States feel about that?

LM: I don't know that it's a race. In fact, the leading commercial space operators actually complement each other. There's a lot of room up there.

A&SL: What is the space law agenda for Congress and the Trump administration? Is the current framework of international treaties sufficient for today and the future?

LM: There is a bill pending in the House of Representatives, the American Space Commerce Free Enterprise Act, which would reform remote sensing. It would increase transparency and add procedural protections for remote sensing operators, who apparently are having problems with NOAA. That bill would also attempt to resolve the Article VI issue we discussed. It would require certifying space objects. On the Senate side, the Commerce Committee is holding five hearings on how to foster a new space frontier. It's a different approach from the House, but they too are hearing from industry that Article VI has created considerable regulatory uncertainty, which industry would like Congress to resolve. One way to resolve it, and I've written about this, would be for Congress to remind the regulatory agencies that they may not implement non-self-executing treaty provisions. The treaty framework does not need to be changed as long as it doesn't hinder commercial activity, and a strict interpretation of those treaties should avoid that problem. Fundamentally, the government needs to stay out of the way of commercial activity if the private sector is to flourish in space.

PM: I agree with you about the treaties, which generally speaking have stood the test of time. In those cases, where the treaties don't quite fit, we have found ways to make them work. Rather than trying to change the treaties, the greater need may be for domestic legislation. I spend most of my time now on contractual matters, where highly specialized contracting practices have evolved. For example, a satellite operator must acquire a satellite, so you need a satellite manufacturing contract. To launch the satellite, you need a launch contract (with the launch company). That contract must comport with the Commercial Space Launch Act, which requires reciprocal waivers of claims, meaning that the launch company and the satellite customer must mutually waive liability, and which requires the launch company to buy third-party liability insurance with the customer as an additional insured. Satellite asset insurance is an important matter for the satellite customer because it has waived claims against the launch company if the launch fails. What if your $300 million satellite explodes during launch? The practice is for the satellite customer to purchase property insurance for the launch and satellite deployment and one or more years of operation in orbit. In addition, as the satellite operator, you don't just launch something. You need contracts for use of the satellite capacity, whether it's a transponder lease, a hosted payload contract, or some other satellite capacity or service agreement. Of course, the financing agreements add another legal dimension. In

short, we are working at the legal intersection of contract law, domestic regulation, international treaties, and insurance law, and these legal disciplines are all interrelated.

A&SL: How important a factor is insurance for commercial space launches?

PM: Insurance is such a critical element in commercial satellite projects. Without the requisite insurance, satellites don't get financed and commercial space launches don't happen. Insurance comes into play before launch, during launch, and over the life of the satellite. As the satellite operator or owner, you would want insurance for all risks that you haven't otherwise contractually transferred to another party and can't assume. The terms for risk allocation in commercial space contracts are relatively standardized at this time.

A&SL: What has been your experience as women in this field? What changes have you seen over the last 20–30 years?

PM: Many of the people who work in the space industry, like the aerospace industry, have a military background, so it continues to be a community that is male dominated. This is less true in the communications/satellite area, especially on the user and media side, where we see a more diverse group. Space law is a fairly new practice area, so I think that has made it more open to women.

LM: For me, it's not about numbers, but opportunities. Thirty years ago, which is when I started practicing law, was not the dark ages. I have always found that people have treated me with courtesy and respect and my gender has not been an issue. I think if you focus on your gender you can make yourself neurotic, and I strongly counsel young women not to do that. Especially now when everything is open. It really is up to your individual efforts at this point. Many people in my old division at the FAA were women. I think it's a very open, receptive field. The law is open for women and you can go as far as you want to. And that's been true for decades.

A&SL: What advice would you give to younger lawyers and law students who are interested in space law—for example, a possible career at SpaceX or NASA or the FAA?

LM: I advise law students who are interested in this area to study administrative law (and of course constitutional law) and increasingly also government contracts because the government remains the primary space customer. A student needs a solid grounding in corporate law (although those issues tend to be handled in-house). I urge young lawyers to get involved in the trade associations, such as the Satellite Industry Association and the Space Transportation Association. You need to network and meet people in this field. Volunteer for whatever working group they have, such as an orbital debris group or even membership outreach. If you get involved, people will get to know you. Fundamentally, space law is just regular old law but about space. Whatever your area of expertise, you can take it to space. I started by focusing on telecommunications law and black lung. So, it can be done.

PM: Space law is a great area for young lawyers. It's a growing area, and a very exciting time because the cost of building and launching satellites is coming down, so that more companies and countries can participate. We still have the big geostationary communications satellites, but we also have seen a proliferation of small satellites and constellations of small ones in low Earth orbit. So more companies and countries are getting into the game, which means there's more work. For a young lawyer starting out today, there is so much more potential opportunity than when I came here in the 1980s. At that time, the work for private practitioners was largely limited to regulatory matters involving satellite communications because companies were doing the transactional work in-house. But that has changed, and if you are a law student or young lawyer looking forward to the next 30 years, the future is full of exciting possibilities in a growth industry.