

**S-2****ASGSR 2020 – President’s perspective****Douglas M. MATSON**

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**1. Abstract**

The year 2020 is a milestone in space science and research. This year marks 20-years of continuous human presence in space through international collaborations aboard the ISS. It also has issued in unprecedented challenges precipitated by the emergence of a pandemic which threatens to disrupt the traditional interpersonal linkages that guide social interaction and constitute the fabric of our society. This talk presents the American Society for Gravitational and Space Research (ASGSR) achievements over the past year and seeks to share how our technical society has adapted to the new normal.

**2. Society activities**

The Society promotes space science research through information exchange, networking and committee service activities. Our organization revolves around work on Education and Outreach, Meetings and Workshops, Strategic Affairs, Communications/Membership, Awards, and publication of our society Journal titled *Gravitational and Space Research*.

**2.1 Mission**

ASGSR is committed to advancing gravitational and space biological and physical science research, promoting communication and networking, and facilitating education and professional development of our membership. We bring together a diverse population of academics, industry scientists and engineers, and government civil servants, all united in the desire to advocate for the advancement of knowledge in space sciences.

**2.2 Recent Accomplishments**

In 2020, AGSR incorporated a sister-organization under US tax code 501(c)(3). The purpose of the Foundation is to allow donors to contribute tax deductible charitable gifts to support Science, Technology, Engineering, Arts and Math (STEAM) educational undertakings associated with the Society’s activities. With new fundraising opportunities, we greatly strengthen our already robust efforts to promote student engagement.

This follows culmination of a multi-year project to increase awareness of the accomplishments of senior members within the society. ASGSR now recognizes a new designation as a Society Fellow to be awarded for exemplary service to the microgravity community. The distinction of Fellow is awarded by the ASGSR in recognition of distinguished scientific and social contributions to the advancement of gravitational and space research in the fields of life and physical sciences in areas of research, education, mentoring, outreach, and professional and public service. Awardees may be from academia, industry, non-profit organizations, and government agencies.

NASA desires assistance in developing plans to meet the needs of exploration missions, provide concomitant terrestrial benefit, and uniquely advance scientific knowledge. Solicitation of input from the greater scientific community is essential in order to make this effort a success. The agency is in the process of critically evaluating how to prioritize planning and development of next-generation scientific investigation topics and tools. NASA is tasking the US National Academies of Sciences, Engineering and Medicine to develop a comprehensive *Decadal* research strategy for the next ten years of life and physical sciences research activities supporting space science. Survey tasks are expected to include the

review of current and emerging areas of space-related biological and physical sciences research, identifying the most compelling science priorities and outlining future facility and platform requirements, recommending approaches to development of a robust, resilient and balanced program of space research, and assembling proof-of-concept research *grand-campaigns* over a broad set of cost categories. ASGSR will be organizing Town Halls and Community Workshops over the course of the Fall of 2020 leading to submission of a series of *white papers* by the general public outlining the big-picture concepts and key next steps to support future NASA missions. ASGSR is uniquely positioned to leverage our leadership in the community and provide structure and organization to the process of encouraging wide participation across the breadth of the space science community. The goal is to educate stakeholders and foster collaborative efforts to generate novel and potentially transformative ideas for future research.

### **2.3 Organizational Changes**

Our Society is based in the US and much of the research funding that sponsors our constituents comes from NASA. It is therefore important to note that a big reorganization occurred this year involving the move of the Space Life and Physical Sciences Research and Applications Division (SLPSRA) within the Human Exploration and Operations Mission Directorate-(HEOD) to become the Biological and Physical Sciences Division (BPS) within the Science Mission Directorate (SMD). The Division Director Dr. Craig Kundrot now reports to Associate Administrator Dr. Thomas Zurbuchen. As part of the public announcement of the change, NASA administration emphasized that while there are some important cultural aspects to the move the basic operation of the Division will remain unchanged.

### **2.4 Annual Meeting**

The pandemic has changed how technical societies operate forever. For the first time in our history as a society we have been forced to cancel our live Annual Meeting and quickly learn how to host a virtual event. As we pivot from live to remote, we have all become virtuosos of the virtual video environment. But we also have learned that networking and interpersonal interaction have suffered. Face-to-face meetings are a thing of the past and travel has been severely curtailed. The traditional Annual Meeting concept with live presentations, vendor tchotchkes, coffee breaks, buffet meals, social hour networking, exotic conference venues, interesting tours, and a formal banquet is not possible. One positive is that our travel budgets for the year are unexpectedly underspent. So, what do our members get out of an annual meeting; what should be preserved, what new ways must be developed, and what is to be mothballed? The new-normal is pre-recorded talks, live break-out rooms, and reduced conference fees – possibly done from the comfort of our own homes and often done asynchronously. What is to happen post-pandemic?

In a surprise twist, due to the pandemic the student abstract submission rate has significantly increased over those seen in previous years. In 2019 the annual meeting saw 29 undergrad, 25 graduate student, and 33 Middle and High School student teams compete for honors. That number has risen in 2020 to 38 undergrad and 62 graduate student submissions. Unfortunately, with many schools nationwide under Covid-19 restrictions, the Middle and High School competition was suspended until next year. We can only surmise that by eliminating travel to the conference venue, many advisors applaud the reduced time and money associated with sponsoring a student to “attend” a virtual event. Member submissions have remained flat, if not slightly reduced, over the same timeframe with 2019 submissions at 280 and 2020 at 256. Due to the cost of producing videos and hosting the presentations online we will have to dramatically reduce content from 158 presentations in 2019 (plus 43 posters) to around 100 video postings (and no posters) in 2020.

One big loss that must be addressed as we move to the new normal is training the next generation of investigators. Without direct interaction the opportunity to develop networking skills required to build robust international collaborations has been severely constrained. Speaking to a camera and speaking to an audience are very different experiences. As a technical society we need to develop a plan to address these shortcomings. We must evolve to combine the strengths of each modality.

## **3. Evolution of Microgravity Research**

With the new decade, the emphasis on NASA-sponsored Low Earth Orbit (LEO) platforms becomes an anachronism. We have seen the dawn of private-sector launch capability driven by the awakening desire to promote commercialization

of space. LEO won't go away, but utilization of NASA resources to support the ISS as a research platform may be decreasing rapidly. Free-fliers, Cis-lunar orbital facilities, Artemis/Gateway/Orion staging, Lunar lander concepts, Interplanetary transit, and Colonization platforms will all compete for development. Securing financial support during this uncertain time will involve a partnership between the national agencies, government contractors, commercial launch operators, industrial partners, and academia. How microgravity research fits into this future is still not clear. But it is certain that international partnerships will ensure a robust space research program. It is the job of the microgravity community, with leadership from our technical societies, to inspire the next generation and encourage growth of these research efforts.

We have all been inspired by individual acts of selfless sacrifice during the global response to the pandemic. It is the responsibility of our technical society to continue to promote good science in the service of our diverse stakeholder population despite these unforeseen challenges. We are committed to the health and safety of our membership and recognize that there is a potential to grow even when faced with difficult circumstances. The pandemic provides us an opportunity for introspection and serves as a motivator for innovation.



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