## Astronauts4Hire: Empowering Suborbital Research

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**Summary:** The commercial suborbital spaceflight industry is poised to take off, offering scientists new platforms to advance research in a wide array of fields from human health, to atmospheric science and technology development. Astronauts for Hire (A4H) is a 501(c)(3) non-profit organization that helps train qualified scientists and engineers for the rigors of spaceflight in order to maximize preparation and scientific return from suborbital flights [1].

**A4H Membership:** A4H provides its member community with training discounts and a support structure to realize their space training and research goals by fostering internal collaboration, external partnerships, and business incubation. There are two types of members in A4H:

Flight Members are established professionals representing a wide range of disciplines in engineering, life, and physical sciences. Eligible to receive A4H training scholarships and represent A4H on research flights contracts, Flight Members are trained to lead all aspects of a spaceflight experiment, serving the customer from concept and through mission operations and data analysis. A4H's 20 flight members are industry professionals representing a wide range of scientific fields specifically trained for spaceflight operational campaigns. Opportunities to join as Flight Members occur on a competitive basis as demand and resources allow.

Associate Members gain access to the same training discount benefits as Flight Members and can leverage the organization to build their own astronaut competencies. Motivated Associated Members are encouraged to take an active role in the A4H organization and contribute to projects. A4H Associate Members have surpassed 100 in number and are growing at a rate of approximately one new member per week.

**A4H Value:** Each mission will present its own unique challenges, necessitating broad training and preparation. A4H provides a cadre of commercial astronauts who can work with researchers and flight operators to ensure payloads fly successfully. A4H members offer value to the suborbital science community throughout the research project lifecycle:

- *i. Proposal writing.* A4H makes sure its members are aware of proposal opportunities from funding agencies as they arise. In some cases, this leads to submission of an awarded proposal authored principally by A4H members [2], and in other cases, members can utilize the A4H extended network to collaborate with an A4H partner on a proposal [3].
- *ii. Payload development and testing.* Many A4H members are experts in space systems engineering and related sciences. They are available to help researchers ensure their experiments become flight-worthy, whether a human is required to tend them or not.
- iii. Mission planning and operations support. Having a well-developed and well-rehearsed operations plan is vital to the success of a suborbital flight experiment. The A4H member base has the operational experience required to ensure mission planning success.
- iv. Spaceflight experiment execution. While some researchers will train to fly their own experiments firsthand, many may not wish to subject themselves to the risk or liability of flying on experimental spacecraft. Also, some researchers may not be medically qualified to fly, don't have the time or funding to undergo spaceflight training, or their expertise may be needed on the ground monitoring telemetry. Qualified A4H members are trained and ready to work with researchers to ensure their flight experiments are successful.
- v. Post-flight services. A4H members can work with investigators on sample processing, data analysis, and publication of research results following a flight experiment.

**Conclusion:** Going forward, A4H will continue to serve the needs of the scientific community through the recruitment and training of commercial astronaut candidates.

**References:** [1] http://astronauts4hire.org [2] Reimuller, et al. (2012), *Eos Trans AGU*, Fall Meet Suppl, Abstract SA11B-07. [3] Komatireddy, et al. (2012), *3<sup>rd</sup> NSRC*, Palo Alto, CA.