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**PRESS RELEASE 051213, December 5, 2013
NEW PLASMA TECHNOLOGY PATENT
ISSUED TO AD ASTRA ROCKET COMPANY.**

[Houston, TX For immediate release] – On November 26, 2013, the United States Patent and Trademark Office (USPTO) issued U.S. Patent No – 8593064 B2, entitled “Plasma Source Improved with an RF Coupling System,” to Ad Astra Rocket Company of Webster, TX, USA. The new company-owned intellectual property (IP) encompasses a wide range of improvements to the plasma technology embodied in the VASIMR[®] engine as well as in numerous related applications of the invention in energy, materials processing and waste remediation, among others. The term of the patent is 22.9 years from the official date of its issuance.

Since its founding in 2005, Ad Astra Rocket Company has continued the maturation of the technology described in the original NASA VASIMR[®] patent and which the US Government licensed exclusively to Ad Astra in 2006. The new company-owned IP is the work of several co-inventors, including: Drs. Mark D. Carter, Leonard Cassady, Franklin R. Chang Díaz, Tim W. Glover, Jared P. Squire and RF engineer Greg McCaskill. The patent is the result of years of research and development the primary goal of which was to optimize the physics and engineering of the VASIMR[®] engine, and it embodies critical refinements to the original patent, which are essential for making the engine operate efficiently and to be technologically viable in the space environment.

Key refinements in the design include a specially shaped helicon antenna that works in concert with the local magnetic field to create an electromagnetic lens focusing the radio-frequency (RF) power at the center of the rocket core. This increases the plasma density and is largely responsible for the high plasma

production efficiency of the device. The high efficiency antenna also allows operation at a lower RF frequency than that of a conventional helicon and enables the use of more efficient solid-state technology for the RF power source, a synergistic benefit that makes the engine more compact and light-weight. Other important features in the new patent include the use of high surface conductivity conductors, such as Litz wire, in the antenna strap and a number of thermal management design options with RF compatible materials to handle the waste heat in the rocket core.

“This is an important technical achievement for our team and a valuable asset for Ad Astra, and it reflects the significant capital investment we have made in advancing the technology” said Dr. Franklin Chang Díaz, Ad Astra’s Chairman and Chief Executive Officer, “I congratulate our team of co-inventors. Our company is grateful for their outstanding contribution to enhancing our technology and increasing our company’s value,” he added.

ABOUT AD ASTRA

Established in 2005, Ad Astra Rocket Company is the developer of the Variable Specific Impulse Magnetoplasma Rocket (VASIMR[®]) engine, an advanced plasma space propulsion system aimed at the emerging in-space transportation market. Ad Astra also owns and operates Ad Astra Servicios Energéticos y Ambientales (AASEA) and Ad Astra Rocket Company, Costa Rica, respectively supporting research and development subsidiaries in the US and Guanacaste, Costa Rica. Through its subsidiaries, the company also develops earthbound high technology applications in renewable energy, advanced manufacturing and applied physics. Ad Astra has its main laboratory and corporate headquarters at 141 W. Bay Area Boulevard in Webster, Texas, USA, about two miles from the NASA Johnson Space Center.