Rad-Hard Electronics

Space launches used to be by or for government only. Today, commercial companies launch space vehicles frequently and made space accessible to civilian. We are at an exciting point in history!
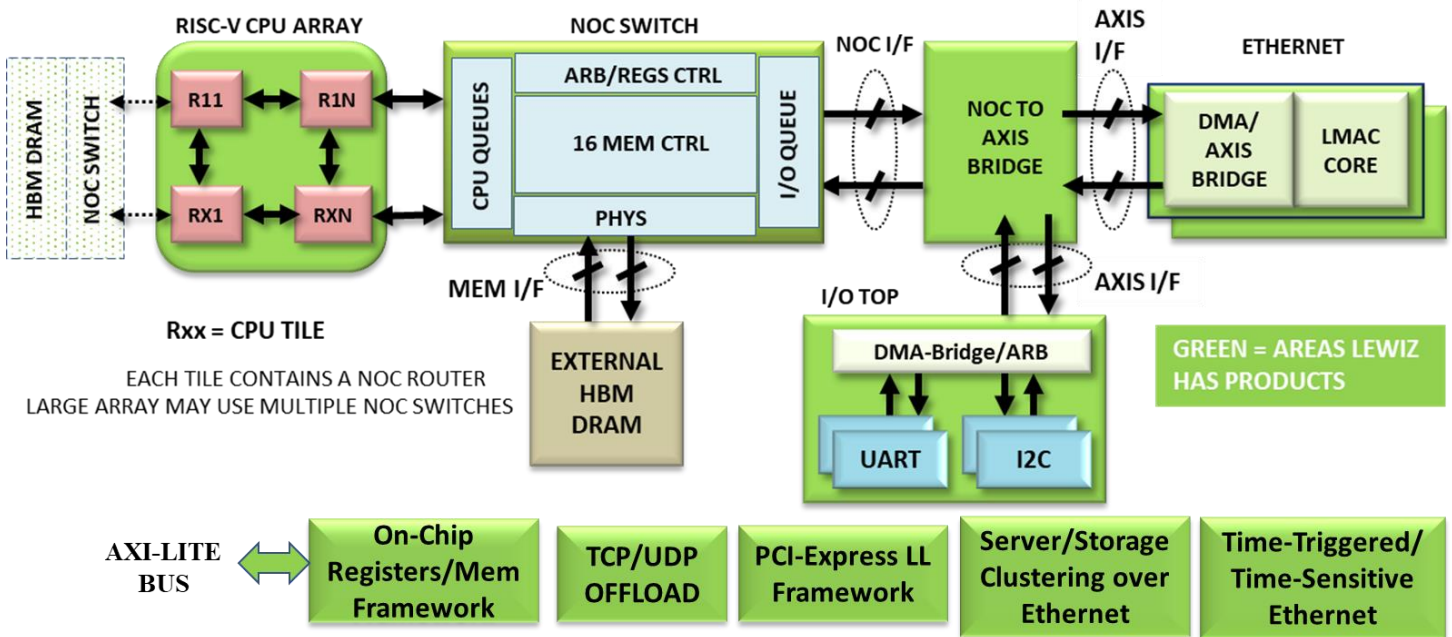
Space system from satellites to rockets/Mars rover/helicopter requires radiation hardened electronics for control, networking, communications, etc. Processors, system-on-chip (SoC), Ethernet/communication components perform the processing, sensing, networking of on-board modules and enabling communication to Earth and so on. They are a critical part of space systems. When we have bases on the Moon, Mars, and other celestial bodies, human, robots, equipment and habitats will also need to be connected and secure.

At LeWiz, we see connectivity whether on-board space systems or on a planet (or inter planets) being a critical part for the success of space missions. New networking technologies such as **time-triggered Ethernet**, **time-sensitive networking** offer additional capabilities, enabling high speed data networking while supporting real-time functions on the same Ethernet network, reducing wiring, power, weight for space systems. We're creating new technology for this area and make it more feasible for use in space applications.

Finding suitable electronics that can withstand the harsh environment of space is still a major challenge. FPGA devices offer the flexibility for creating different types of functions and can be found in just about any space system. But as time goes, less components and less capable devices will be available for space applications. With the advancement of **deep nano meter silicon** and **embedded FPGA** (eFPGA), **ASIC devices** would offer higher integration, lower power, and more capabilities. However, design and testing rad-hard, advanced ASIC require specialized knowledge. In eFPGA, rad-hard technology and solution with fast error recovery is almost non-existence. We seek to advance the industry in this area.

It is truly an exciting time and we are happy to contribute to the advancement of human space exploration.

Highly integrated SoC and FPGA devices, however, require many **IP cores**. We develop and license RISC-V processor, accelerators, bus interfaces/bridges, memory controllers, networking cores, DMAs, and other peripherals (shown below in GREEN). These cores come with supporting **software and verification**. We also provide **services to develop custom or programmable ASIC in advanced nano-meter silicon**.