

SPACE EXPLORATION SYMPOSIUM (A3)
Space Exploration Overview (1)

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AN INTERNATIONAL, INTERDISCIPLINARY AND INTERCULTURAL PERSPECTIVE ON THE
STUDY OF EXTRASOLAR PLANETS AND ITS IMPLICATIONS FOR HUMANITY**Abstract**

Humanity's fascination with the notion of planets outside of our Solar System is intrinsically tied to our sense of place in the Universe. A geocentric ("Earth centered") model of the Universe, most commonly attributed to the ancient Greco-Roman astronomer and mathematician Claudius Ptolemy, was accepted for almost 1,400 years until it was superseded by the heliocentric ("Sun centered") model advocated by Renaissance astronomer Nicolaus Copernicus. For many years, the assumption that other stars are surrounded by planetary systems was nothing more than a reasonable hypothesis based on the Copernican principle of humanity's non-preferential position in the Universe. Another seemingly reasonable assumption was that such systems, once discovered, would turn out to be similar to our Solar System. Since the first detections of exoplanets in the 1990s, orbiting the pulsar PSR B1257+12 and the main sequence star 51 Pegasi, the number of confirmed exoplanets now exceeds 1,000 with another 3,000 candidates awaiting verification. One of the most surprising findings is that exoplanetary systems appear to be very diversified and quite unlike our Solar System. As both ground-based and space-based observational and analytical tools improve, an increasing number of exoplanets are being discovered. With these new tools, it is becoming possible not just to find planets but also to study their basic structural and atmospheric characteristics. Many of the exoplanets now being found include smaller rocky bodies closer in size to the Earth, sometimes in orbital locations that might be conducive to life.

At the 2014 Space Studies Program (SSP) of the International Space University (ISU), which took place in Montréal, Québec this past summer, participants undertook a team project that sought to contribute new ideas to the field of exoplanets research from an unconstrained international, interdisciplinary and intercultural perspective. In addition to the scientific and engineering aspects of the subject, the project sought to address the social consequences of exoplanet discoveries and coming up with new ideas for

increasing the scientific return from both space-based and ground-based investigations through improved communications and collaboration amongst researchers worldwide. This paper summarizes the findings and conclusions of the ISU SSP 2014 Exoplanets Team Project.