

# Astrophysicists offer new research, tool for identifying habitable zones

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Cuntz's Binary Star Habitable Zone Calculator, or BinHab, allows for the calculation of S-type and P-type habitable regions in stellar binary systems.

Research by a University of Texas at Arlington astrophysicist sheds greater light on S-type and P-type binary stars and forms the basis for BinHab, a new online tool that can be used to calculate the regions of binary systems favorable for life, commonly known as habitable zones.

In P-type systems the planet orbits both binary stars. In S-type systems, the planet orbits only one of the stellar components with the second component left to agitate the setting of the planet.

Astrophysicists have been tackling the problem of identifying [habitable zones](#) for many years. However, the method developed by UT Arlington Physics Professor Manfred Cuntz provides a comprehensive mathematical approach for both types of habitability.

"The challenge is to properly consider two separate criteria consisting in the amounts of stellar radiation, which provides a favorable planetary climate for life, and the gravitational influence of both stars on an existing planet," Cuntz said.

Cuntz presents his work in a paper to be published in January 2015 in the *Astrophysical Journal*, a lead publication in this field of study. The paper is available online [here](#). The first paper in the series was published in the journal in Jan. 2014 and is available [here](#). Some of his results will also be presented at the 225th Meeting of the American Astronomical Society in January in Seattle.

Cuntz's research is based on a pure theoretical approach but it is directly relevant to the interpretation of [observational data](#), including those by NASA's Kepler mission. Previous work at UT Arlington includes studies of Kepler-16, a [binary system](#) discovered in 2011, which is known to host a Saturn-type planet in a P-type system, implying that it orbits both stellar components, Cuntz said. Billy Quarles, a former UT Arlington graduate student, currently working at NASA's Ames Research Center, led that work.

James Grover, interim dean of the UT Arlington College of Science, said this latest work holds enormous potential for those who study space in the search for life.

"Dr. Cuntz's work holds a wide range of applications, including the assessments of observational data for extrasolar planets," Grover said. "Additionally, the work has ramifications toward the field of astrobiology. UT Arlington students and the astrophysics and astrobiology community at large will benefit from the work and new BinHab tool."

BinHab is explained in part in a paper that Cuntz presented last summer at the 18th Cambridge Workshop on "Cool Stars, Stellar Systems, and the Sun." The Lowell Observatory in Flagstaff, Ariz. hosted that meeting.

Provided by University of Texas at Arlington

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