

Exoplanets: Where are we after 20 years of interdisciplinary research

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Introduction: Since the first confirmation of a planet outside the solar system in 1993, the study of exoplanets has become one of the most productive and exciting research areas. The impact of the Kepler Space Telescope is undeniable, and the most recent James Webb Space Telescope promises so much. Yet, there has not been an overall evaluation of exoplanet research.

Methods: This study aims to conduct a scientometric analysis of publications indexed in the Web of Science database. A total of 5858 articles published between 1993 and 2021 are examined using VosViewer and Bibliometrix package of R software utilizing bibliometrics and network analysis techniques.

Findings: In less than two decades, the field has bloomed. The annual growth rate for scholarly publications is 30.98%. The number of citations has increased as well; on average, each document has 25.65 citations.

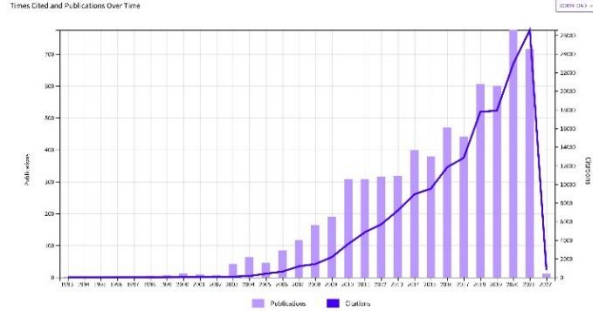


Figure 1 – Number of articles & citations per year

The exoplanet research is collaborative; the average number of co-authors per document is 10.6. The collaboration is evident in co-authorship network as well. There are seven co-authorship clusters that coincide with the expertise of the scholars.

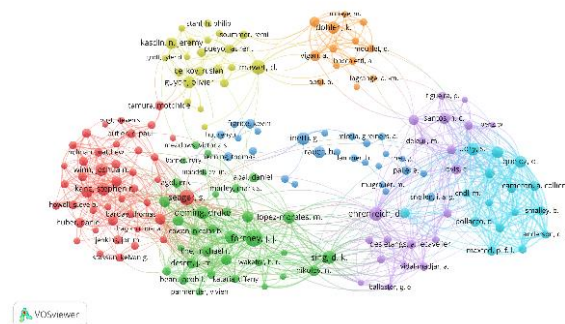


Figure 2 – Co-authorship network

Our findings suggest that exoplanet research is interdisciplinary. Publications are published in a variety of journals. Astronomy Astrophysics, Optics, Instruments Instrumentation, Engineering Aerospace, Physics Applied, Geoscience Multidisciplinary, and Biology are to name a few of their Web of Science categories.

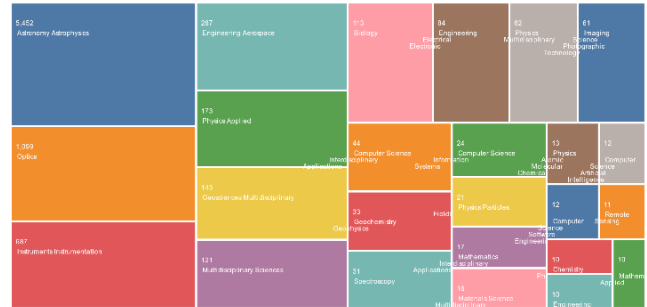


Figure 3 – Web of Science categories for documents

An analysis of key concepts in titles, author keywords, and abstracts revealed similar diversity ranging from exoplanets to spectroscopy to planetary atmospheres to stars to hot Jupiters.

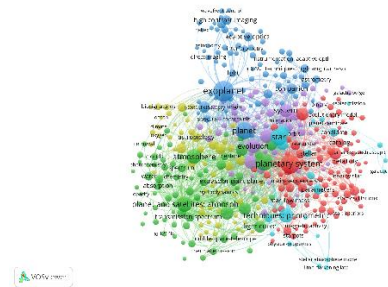


Figure 4 – Key concepts network

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Understanding how exoplanet research have evolved may help the scientific community focus their research better. Furthermore, potential interdisciplinary connections may be identified, which may result in groundbreaking discoveries.