

Pioneers on the Astrosociological Frontier: Introduction to the First Symposium on Astrosociology

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Abstract. Astrosociology is a relatively new multidisciplinary field that scientifically investigates *astrosocial phenomena* (i.e., social, cultural, and behavioral patterns related to space exploration and related issues). The “astrosociological frontier” represents an analogous framework to that of space as the “final frontier,” as both territories are quite empty of human activity and ripe for exploration. This focus on the astrosociological frontier provides insights about the need for a social-scientific field to place the human dimension in its proper place alongside familiar space community concerns such as engineering. The astrosociological frontier refers to the lack of development of astrosociology as a scientific field – or anything like it earlier during the space age. It includes both the 1) unoccupied “landscape” in academia characterized by the lack of astrosociology in its curricula and 2) dearth of space research focused on social-scientific (i.e., astrosociological) topics both inside and outside of traditional academia in collaboration with traditional space community members and the new space entrepreneurs. Within academia, the “frontier” is characterized by a lack of courses, programs, and departments dedicated to astrosociology. In the future, proponents of this new field expect the astrosociological frontier to become characterized by a growing number of “settlements” in curricula across the country and world. As things stand, however, the early “astrosociological pioneers” include those who seek to explore these underappreciated issues within academic and professional climates that discourage them from pursuing their interests. Thus, the “1st Symposium on Astrosociology” at the 2009 SPESIF conference represents an important expedition consisting of pioneering participants willing to venture into a little-explored territory with the goal of developing astrosociology.

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INTRODUCTION TO THE ASTROSOCIOLOGICAL FRONTIER

The *astrosociological frontier* exists due to the absence of social science curricula in schools and the limited amount of research regarding what we now call astrosociological topics. Its designation as a “frontier” signifies its undeveloped character. The dearth of academia’s attention to astrosociological matters, while not surprising based on the history of space exploration, presents faculty, scholars, students, practitioners, and advocates with nowhere to turn should they wish to pursue the social-scientific study of space exploration and related topics. During the space age thus far, the greatest number of those who conducted research in areas now regarded as astrosociological subject matters followed a conventional path that tended to focus on traditional – and thus easily accessible – topics within their chosen fields or disciplines such as sociology, economics, psychology, or anthropology. The discovery of the astrosociological frontier as an important territory for academic exploration will open up a new land of intellectual opportunity, though whether we act upon it in a timely manner remains somewhat uncertain.

The founding of astrosociology in July 2003 provided the first hint of an astrosociological frontier. It seems apparent that before this author (Pass, 2004a and 2004b) declared its very existence with the uploading of the original website called *Astrosociology.com* largely – out of frustration due to its longstanding absence – scarcely anyone recognized that this frontier even existed. The exceptions to this rather general statement receive recognition a bit later. More importantly perhaps is the fact that most did not even recognize its significance or relevance to everyday social life or its relevance to the future of humanity (assuming it took the logical step of exploring,

working, and living in space environments). At this moment, the astrosociological frontier possesses the great potential to transform from an empty, unexplored land to a thriving community of similarly oriented social scientists and others who recognize the potential of astrosociology. The astrosociological pioneers will make such an academic change possible and participate in its making. Perhaps the most exciting aspect of this transformation lies in the fact that students will serve as the greatest impetus for the settling of the astrosociological frontier within academia.

UTILIZING THE OTHER BRANCH OF SCIENCE

Space exploration has primarily focused on engineering and the other STEM (science, technology, engineering, and mathematics) subjects for its entire fifty-year history in the United States and the space programs of other nations. The Soviet Union/Russia had a much more active psychology program than the U.S., though they did not tend to publish their results.

“NASA’s promotion of the so-called STEM fields represents a laudable effort, to be sure, as post-industrial societies must depend on a large cadre of students to pursue them in order for progress to occur, but it is also shortsighted in the sense that its exclusion of the social sciences continues a status-quo tradition that will fail to meet future needs. The “S” in “STEM” refers to the natural/physical sciences and *not* the social sciences. This designation refers to the old approach common during the space age. Both NASA and advocates of improved education at all levels of concern must realize that the future of space exploration cannot succeed nearly as well without a formal collaboration between the natural [and physical] sciences and social sciences...[T]he sociological discipline [as well as the others] needs to formally enter the space age...” (Pass, 2007b).

Staying with the astrosociological frontier metaphor, the traditional members of the space community (excluding the social scientists) often catch a glimpse of this territory’s promise, but they do not possess the knowledge and training necessary to explore the frontier alone in ways that would further research into astrosociological issues. While their expertise lies in the natural and physical sciences, a growing number see astrosociology as relevant to them.

On the other hand, social scientists – except for a dedicated few – fail to recognize the astrosociological frontier for what it is. Their lack of exploratory zeal in this area slows the exploration and settlement of this largely uncharted land. The *other* branch of science, which consists of the social sciences, isolates itself from astrosociological issues for the most part. These existing conditions have implications not only for astrosociology, but also for human involvement in space. Is the continuation of these circumstances compatible with exploration of the final frontier? The answer to this question touches on the very existence of the astrosociological frontier and the urgent need to explore it.

With only professional astronauts and their equivalents – along with a few recent space participants – who have not yet reached 500 members leading the way in space operations, these programs could get away with minimal input from social scientists. However, with plans for more humans to travel into space, including an increasing number outside of space agency efforts, the need to understand the *human dimension* (Harrison, 2001) will become even more crucial to success, especially for long-duration missions and settlement efforts. The *other* branch of science always received little consideration in the past. What is more, the social science community did not push the issue. The great bulk of social scientists did not attempt to engage with space scientists or engineers; they did not show much interest in space or its impact on terrestrial societies. Even in the near future, however, space participants will partake in suborbital flights and even stay in space hotels while others continue their plans to visit the Moon or settle on Mars. Such a human presence in space clearly indicates a concrete need to merge the knowledge bases of both branches of science. Upcoming commercial space ventures of various types will thus intensify the need for astrosociological input.

Humanity’s expanded presence in space will require input from *both* branches of science, requiring construction of a formal collaborative structure so that all facets of space exploration and related issues receive the most comprehensive investigation on a permanent and unfettered basis. In this manner, participants from both branches of science can construct a well-balanced knowledge base (rather than the one-sided version common during the first fifty years of the space age). Collaboration between the space and social science communities will prove vital, not just on an informal basis which cannot ensure ongoing progress, but on a formal basis that fosters innovative

thinking through the interplay of scientists from each of the two branches of science. In part, astrosociology takes on the responsibility of 1) organizing social scientists interested in space research and 2) allowing for collaboration with the natural and physical scientists traditionally working in space-related fields. In effect, these efforts serve to bridge the long-established chasm between social science and aerospace (Dudley-Rowley, 2004), allowing for progress both inside and outside of academia.

EXPLORING AND SETTLING THE ASTROSOCIOLOGICAL FRONTIER

The astrosociological frontier currently exists as a wide-open territory standing empty for new astrosociologists to build curricula and populate with astrosociologists. In practical terms, this equates to the inclusion of astrosociology in existing departments and programs, starting out as a piecemeal subject matter introductions in existing courses. In the future, the plan is to expand to full courses and programs dedicated to this new field. In the beginning, however, progress will seem slow, but it will continue methodically over time as it has thus far.

Astrosociology's frontier currently includes a relatively small number of dedicated social scientists "camping out" in its wilderness. In addition, "campers" from the space community who recognize its value provide an additional impetus for exploring new possibilities unlike those that existed in the past. Consequently, a growing number of individuals now exist at its outskirts – characterized by their demonstration of an expressed interest in a new field even without an academic presence of "astrosociology" per se – so the impetus to explore further grows among the newly emerging pioneers. Programs with other names have preceded this movement, paving the way for astrosociology (for example, see Whitney, 2006). Metaphorically, the idea of "camping out on the outskirts" refers to the types of progress that exclude direct participation by academic organizations such as colleges and universities. However, *indirect* participation does involve faculty and students who support the field of astrosociology at conferences and in other ways, so a growing number of academic connections to this new field continue to accumulate over time.

If humans plan to travel into outer space for any reasonable period and any reasonable distance, as Finney and Jones (1986) and others have long speculated, they will need to tap the expertise of social scientists who will serve most commonly as astrosociological pioneers. The *other* branch of science, consisting of the so-called "soft sciences," requires inclusion in exploring and settling the final frontier (Gangale, 2004). Social interaction, social structures, and culture all play functions indispensable to human social life. This seemingly obvious insight brings up an important question. How can human social groups relocate themselves in isolated and dangerous space environments without a substantial involvement of social scientists? Unless they return to Earth, space settlers will need to learn how interact with one another civilly and productively. Space habitats must be livable and not just survivable (Pass, 2007a). The social environment is just as important as the physical environment (Pass, 2006). Thus, the exploration of astrosocial phenomena while settling the astrosociological frontier will contribute greatly to improving the quality and success of human activities in space.

The Astrosociological Pioneers

As President Kennedy stated in 1962, choosing to "go to the Moon...and do the other things" is not an easy choice. Those who decide to pursue something ambitious like astrosociology do so because they are hard. They recognize the great challenge ahead and nevertheless decide to meet that challenge head on. Such commitments present a challenge that largely counters the status quo. They present a new way of doing or thinking about things. In the case of astrosociology, the challenge presented exists most glaringly in academia, both within STEM-related and social science departments and programs.

Before moving ahead, it is important to point out that the earliest pioneers were not technically "astrosociological pioneers" because they worked in an environment in which this field designation did not yet exist. They were social scientists who studied the social-scientific implications of space exploration and settlement without commitment to a specific subfield designation. They worked within their traditional disciplines.

"[Thus], a few progressive sociologists [and other social scientists] paved the way for the establishment and development of astrosociology through their advocacy for space activities, now known as *astrosocial phenomena*, as an

important element of social life. While the work of Allen Tough (1998) directly influenced [this] author to establish astrosociology (Pass, 2004a), the others kept the idea alive over the years. Most sociologists, perhaps nearly all, have simply ignored outer space as an irrelevant and perhaps illegitimate subject matter. Harrison (2005) [who has conducted “astrosociological” research for over thirty years] has commented that astrosociology will experience difficulties similar to what SETI faced before it was finally accepted by the scientific community...” (Pass, 2008).

Several others such as space psychologist Paul Suedfeld and anthropologist Ben Finney paved the way for a field such as astrosociology (see; Suedfeld, 1991). Thus, early pioneers from various social science disciplines contributed. Their work provides a foundation on which astrosociologists can build social structures on the frontier.

Acceptance will not prove easy to come by on a large scale at first. Astrosociology’s development will continue to gain momentum among students and some faculty. Indifference continues to pervade the mainstream and thus the status quo remains a strong barrier to rapid development.

“However, this indifference is not a universal attribute characteristic of all sociologists [social scientists, and supporters from other fields and disciplines]. Bluth (<http://er.jsc.nasa.gov/seh/sociology.html>), for example, advocated the study of space issues from a sociological perspective long ago. Bainbridge (1991) made an important observation about sociology’s indifference. Part of his argument involved the recognition that in the face of a substantial interest in space on a societal scale (among citizens and space scientists), sociologists are less well prepared to deal with it compared to the scientists in the so-called “hard sciences.” Rudoff (1996), in considering the importance of astrosocial issues, asked a simple though very revealing question: “And where is sociology?” A simple conclusion thus presents itself. Bluth, Bainbridge, Rudoff, along with Tough (1998) and many others, have long recognized the potential value of the “sociology of space” to the discipline and to society. Proponents of astrosociology continue to marvel at its absence in the face of this untapped potential...” (Pass, 2004b).

One must view the phrase “sociology of space” in the broadest possible context. Thus, one may consider it as a representation of the notion that *people* will settle the astrosociological frontier as social scientists increasingly recognize the importance of outer space to social life. Moreover, the astrosociological pioneers (i.e., those cognizant of astrosociology as a concrete field) will carry forward in their exploration of an academic and research-based territory vaguely mapped out by the previous pioneers, some of whom referenced above, who ventured out before them. The fact that the astrosociological frontier exists today speaks to impact of the earlier pioneers.

Progress in settling the astrosociological frontier will take many forms. For example, astrosociological pioneers must challenge the STEM “call to arms” by emphasizing the need for a much more balanced approach in recruiting students to major in subjects related to space. A major change in current approach must include attracting non-STEM students to space research. One must not think of it as a zero-sum (i.e., “winner takes all”) game. The new astrosociologists will add to the STEM-oriented student body because most would never have selected a STEM subject in the first place. The big change will come when a significant number of social scientists begin to select outer space as a concentration over the traditional areas commonly available to them within their chosen social science disciplines. When they begin to recognize the connections between space and social life – not to mention individual behavior – then the strong movement toward settling the astrosociological frontier will begin in earnest.

Evidence for Student Interest in Astrosociology

Student participation in the exploration of the astrosociological frontier has already begun. This author is aware of two major pieces of evidence that indicate the presence of considerable student interest. Of course, the overall population of students interested in astrosocial phenomena, as well as their level of commitment, remains unknown. Measurement of such variables represents an important area of research and thus requires further investigation.

Results from a Student Survey

Admittedly, much of the evidence for student interest in astrosociology nearly borders on anecdotal experiences. However, one small study by this author has shown a strong interest among sociology students in three introductory classes during the Spring 2005, Fall 2005, and Spring 2006 semesters at a community college (Pass, 2007c). An optional question between two possible choices appeared on the final exams of these students with aspirations to major in a multitude of different subjects. Very few of these respondents were sociology majors.

The question on the three final exams read as follows:

“(2) *Would you be interested in a course called **Introduction to Astrosociology**? This course would focus on issues associated with the relationship between space exploration and society, including the influences of space activities on social/cultural change and the future development of human societies on Earth and eventually in space itself. Please explain the reasons for your interest or lack of interest in astrosociology...*” (Pass 2007c).

[The other optional question focused on social inequality].

This author informed students in a very clear manner that the basis for grading centered on the quality of their answers, and not on which question they selected or their preference for or against taking an astrosociology course. Admittedly, the total number of respondents was only forty-five for three *Introduction to Sociology* classes at a junior college. However, this was a commuter college, so students would often need to increase the time needed to earn their Associate Arts degrees in order to take the proposed course. The hardships imposed on them by taking an unneeded general education course makes the responses that much more compelling.

The combined results of the surveys fall into three collapsed categories (Pass, 2007c). The largest category – eighty percent – consists of students who expressed an interest in astrosociology. These students unequivocally stated their intention to take the astrosociology course described if it ever materialized. The smallest category consists of only three percent and includes those stating they have no interest in astrosociology. Thirteen percent of the respondents expressed mixed feelings about the course. One good example includes those who could not take the course themselves but recognized the value of astrosociology and/or their interest in astrosociological issues. A few of these respondents noted that they would alert friends who they believed would have an interest in the new course.

Independent Student Contact

Another source of evidence relates to the growing number of students contacting this author. These students typically inquire about how to pursue astrosociology on the astrosociological frontier. They recognize the difficulties involved as they clearly see the absence of astrosociology in their curricula and report they even encounter resistance from their own faculty about conducting astrosociological research, even for term papers. The Astrosociology Research Institute (ARI) was established to assist students and others with this sort of dilemma common on the astrosociological frontier (see URL <http://www.astrosociology.org>). ARI exists to conduct research and assist others to do the same. In addition, ARI seeks to help students explore the astrosociological frontier and to assist in its settlement through the establishment of courses and programs centered on this new field in colleges and universities throughout the United States and the world.

Students can clearly define the astrosociological frontier in contrast to nearly their entire faculty. Students from both branches of science recognize the need for collaboration between the social science and space communities. Those from all social science and humanities disciplines, in addition to those who wish to participate from the arts, have contacted this author almost from the very inception of astrosociology. Additionally, students from traditional aerospace departments and programs inquire about how astrosociology applies to their fields and disciplines. The two *Astrosociology Student Forum* sessions taking place at the AIAA Aerospace Sciences Meeting in early January 2009 provide a good example of this. Students interested in space from both branches of science more commonly recognize – and seek to explore – the connections between space and society/humanity. Thus, this author’s optimism continues to increase that students will play a large role in the exploration and settlement of the astrosociological frontier in the coming years.

Difficulties for Astrosociological Pioneers Ahead

The astrosociological frontier exists in academia as a barren wilderness. Despite the foregoing discussions of the earlier astrosociological pioneers, it remains a fact that very few academicians even know of its existence at this point. Pioneers will need to tread carefully as they will experience difficulties along the way. The developers of the field recognized this problem early in the development of astrosociology. The history of previous attempts to develop new fields frequently results in resistance to new areas of study.

“Taking the first groundbreaking steps reflects a most difficult commitment due to the absence of...[an] academic safety net. The first astrosociological pioneers must lay down the foundation for a well-respected [field] so that others can follow at some future point without reservations related to harming their careers or fearing that astrosociology will never achieve acceptance in the [social science] community. They will be the ones who receive the greatest criticism based on their overt attempts to demonstrate the long-denied legitimacy of astrosocial phenomena...” (Pass, 2005).

The early pioneers conducted research from within traditional disciplines without advocating the establishment of a new field. In contrast, the new astrosociological pioneers must make the case for a new field. Their efforts will challenge the status quo that benefits the current power brokers in their fields. Resistance will undoubtedly occur.

The difficulty of developing astrosociology lies in its absence during the first fifty years of the space age. One must ask why a field such as astrosociology did not develop earlier than 2003. Why has the astrosociological frontier remained elusive for so long?

“Before moving forward, it is important to recognize that the pioneers of astrosociology have a very difficult task ahead of them. Attempting to add an entirely new subfield of sociology or any social/behavioral science to an existing department is fraught with resistance and ridicule toward those who attempt it. Astrosociology itself must overcome suspicions of outsiders that it does not, in fact, represent a legitimate subject matter. Otherwise, why else are the equivalents of “astrosociology” programs not already part of social science departments? In all probability, astrosociology will need to overcome many of the legitimacy issues that programs related to the Search for Extraterrestrial Intelligence (SETI) fought and overcame during its development...” (Pass, 2007c).

These concerns are indeed serious, and may scare off the tenderhearted, but the repercussions of their successes will result in progress in outer space and other positive outcomes for all involved. The space community will benefit from an infusion of new relevant data that make human space exploration and settlement less risky. The students will find the frontier opened up for exploration and thus have the opportunity to study of a new exciting field. In addition, even the academics and social science leaderships will reluctantly find that the astrosociological frontier is a new and legitimate territory that creates much needed excitement and dynamism in their disciplines.

Astrosociological pioneers already exist on the frontier. They receive support from existing astrosociologists though not so much from within their departments and programs. Yet their interest in the new field persists. They participate in astrosociology sessions at conferences and contact this author in growing numbers to learn how they can pursue this new field. Moreover, many in the space community have decided to explore the frontier along with the social scientists, providing opportunities at conferences and within professional organizations. How much will these emerging realities mitigate the difficulties of the astrosociological pioneers? The only way to find out involves moving forward with the development of astrosociology.

THE FIRST SYMPOSIUM ON ASTROSOCIOLOGY

One important way to demonstrate the legitimacy and relevancy of astrosociology involves the acceptance of the field at prestigious conferences normally dedicated only to engineering and other disciplines/fields traditional to the space community. The acceptance of the First Symposium on Astrosociology at the first SPESIF conference indicates that this fledgling field possesses an air of legitimacy and belonging in the academic world.

What does astrosociology have to do with space propulsion and the energy sciences? These areas of study reside in the physical/natural sciences – and certainly *not* in the social sciences. The focus on education, reflected in the theme of the conference – stated as “integrate, educate, support: going beyond the dream” – applies to the two branches of science as much as anything else. The recognition exists that the social sciences increasingly become important as humanity moves into space and the impact of space activities increasingly affects terrestrial societies. A full symposium on astrosociology within an otherwise traditional space conference confirms this observation.

Social science students who constitute the astrosociological the future pioneers will complement those majoring in STEM subjects, and this will result in structural changes on the astrosociological frontier akin to homesteading the Western frontier in America’s past. In this case, the structures will consist of social structures within colleges and universities in the forms of courses, programs, and departments dedicated to astrosociology. Ties to aerospace

departments and programs will prove essential, as they will support collaboration akin to what exists at the STAIF conference itself.

The status quo represents a difficult obstacle to overcome. Those within academia who protect it do not want to see something like the astrosociological frontier emerge. They want to keep it hidden or simply fail to recognize it themselves. This symposium may well serve as a wakeup call to some of those who do not understand the value of astrosociology to their disciplines and to space research in general. The astrosociological pioneers may indeed need to force their hand to instigate change. Regardless of the obstacles before the astrosociological pioneers who now exist and for those who join later, this symposium represents a great step forward.

Pressure from the Space Community

Astrosociological pioneers within the space community who truly value the potential contributions of social-scientific input to their own work can help to expedite astrosociology's development by requesting astrosociologists to participate in the planning of missions, attend conferences, and engage in relevant research for their organizations. A strong enough clamor for astrosociologists will start the leaders of the status quo thinking about the possible need for change. And, although it may challenge their strongest instincts to protect the way things currently exist, they will start to see the value of astrosociology as a means to make their own disciplines more relevant to future trends.

While human factors research (<http://hefd.jsc.nasa.gov/>) has started this process of collaboration from within the space community, it now falls to the social scientists to add the theories and research findings of their disciplines to the mix. This will contribute new knowledge. Human factors researchers should apply formal pressure to the professional organizations that consist of the social scientists by expressing an urgent need for social science input. They should seek out collaborators in a forceful manner.

Pressure from the space community can contribute to forcing leaders of departments and programs to begin recognizing the need to explore the astrosociological frontier. One way to achieve this may come from leaders of aerospace departments requesting interdisciplinary courses between astronomy and psychology or between engineering and sociology programs, for example. The multidisciplinary nature of astrosociology makes such a course of action plausible. Even today, supporters exist from fields and disciplines from both branches of science.

CONCLUSION

Pioneers who decide to leave the safety of well-established subjects to embark on an unknown adventure on the astrosociological frontier face difficulties, including obstacles from entrenched though often well-meaning faculty who advise their students to stay on the "safe" marked path toward a career. There is no doubt that pursuing astrosociology takes fortitude. One must not take the transformation of a largely unexplored wilderness into a settled territory for granted. Astrosociological pioneers will meet resistance in many forms. The task will seem impossible to some at various points along the way. Thus, the difficulties ahead must receive proper identification resulting in relevant responses that aid in their mitigation.

Students and others from both branches of science have already begun to explore the astrosociological frontier. As this first symposium on astrosociology demonstrates, many established professionals *do* recognize the value of this new field. This symposium could not occur without the approval of SPESIF officials, including those who work for NASA. And, therein lays the irony. The space community already has shown that it understands the importance of bringing in the social sciences. In contrast, sociology and the other social sciences do not demonstrate the same acknowledgment.

The professional social science leaderships continue to serve as the barriers to settling the astrosociological frontier, or fail to see it, because they tend to focus on "civilization" characterized as the traditional subfields of their disciplines. In many ways, their views of civilization look mostly to the past rather than to the future. These leaders elect not to explore the wilderness of the frontier. They should be careful; however, as the new pioneers of the astrosociological frontier will consist of their students to a significant extent who yearn for something new and yet

ever more relevant to social life. The leaders of students should pay attention to the existence of the astrosociological frontier and seek to explore it, lest the pioneers who consist partly of their students force them to do so grudgingly. This latter scenario will result in confrontation and disappointment among students along the way. Other pressures may also come to bear such as space community members who seek professional astrosociologists to collaborate with them in their efforts and fellow faculty members who decide to become astrosociological pioneers themselves.

If humanity moves into space in a big way, then astrosociology will prove itself invaluable as a complement to issues from the natural and physical sciences. One important question requires consideration: Will humanity settle the *astrosociological frontier* in time to explore the *final frontier* to provide the best preparation possible to succeed? The only way to prepare for space exploration and its related activities is to begin settling the astrosociological frontier now – that is, to develop astrosociology within the academic and professional ranks of social scientists. In addition, the astrosociological frontier is open to non-social scientists who wish to incorporate astrosociological knowledge into their work and/or collaborate with astrosociologists. Education will need to change on Earth if we are to witness the development of true spacefaring societies (Pass and Harrison, 2007), that much is clear.

While this first symposium represents an excellent forum for making people aware of the astrosociological frontier, the future of the field lies with acceptance of it by those with the power to institutionalize it into the existing educational system. Successful settlement of the astrosociological frontier will take the form of astrosociology becoming part of the mainstream academic curricula in existing colleges and universities. The development of astrosociology will move forward significantly once faculty, department chairs, and other administrators recognize its value. At the same time, pressure from the bottom up, from students who wish to study astrosociological phenomena, must receive attention and nurturing. Perhaps at the second symposium on astrosociology, the addition of a student forum session aimed at supporting students who wish to study astrosociological issues signifies an important goal. To be sure, the support of all those with an interest in astrosociology must remain a top priority.

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