Michael F. Schatz
Professor and Interim Chair, School of Physics
837 State Street, Georgia Institute of Technology
Atlanta, Georgia 30332-0430, U.S.A.
EMAIL ms201@gatech.edu
PHONE (CELL) 404-445-4435 FAX 404-894-9958

February 7, 2022

Selection Committee
Faculty Award for Academic Outreach
Center for Teaching and Learning

Dear Colleagues:

I hope this finds all well with you and yours.

I am writing to *strongly* support the nomination of **James (Jim) R. Sowell** as a candidate for receiving the 2022 Faculty Award for Academic Outreach by the Center for Teaching and Learning. Simply put, no one has done more than Jim to advance astronomy education and outreach at Georgia Tech, in the Atlanta metro area, and the State of Georgia. Jim has made monumental contributions in three major categories: (1) Astronomy Education Infrastructure, (2) K-16 Astronomy Education, and (3) Astronomy Public Outreach. As a colleague of Jim's for more than two decades, I have been privileged to witness his work firsthand; below I briefly highlight Jim's accomplishments, which indicate why he so richly deserves this award.

Astronomy Education Infrastructure. Jim is singlehandedly responsible for bringing a campus observatory to Georgia Tech, which, much to our embarrassment (and despite being a world-class scientific and engineering educational institution), did not have an observatory for more than 120 years. Here's the backstory: one day, back in the early-2000s, Jim stormed into my office and slammed onto my desk a Georgia Tech undergraduate student recruitment brochure boasting about the rich abundance of on-campus research opportunities; on the brochure's cover, front and center, was a picture of a telescope — from another institution! Jim indignantly exclaimed, "This is false advertising!" (I had to agree.) Jim promptly went to work to fix this; He wrote successful proposals to buy observatory equipment; he cajoled Northrop Grumman to donate more funds to equip the observatory properly. He hounded incessantly the Georgia Tech administration to provide the resources to construct an observatory structure on the roof of the Georgia Tech Physics building. He pushed and prodded the whole process along for numerous years until the observatory was up and running in Spring 2007. The observatory has since become the foundation for transformative astronomy education experiences for many thousands throughout Georgia.

Jim has also driven infrastructure development to support a novel educational resource — daytime access to real-time astronomy for Georgia K-12 and college classrooms via a remotely-operated observational platform located in a time zone very different from Eastern Standard/Daylight Savings Time. Jim brokered a partnership between Georgia Tech and the Air Force Research Lab to establish a facility on Maui — aptly named the "Aloha Telescope" which is currently beta-testing classroom usage. Jim has been working tirelessly to develop all the components necessary to enable the Aloha Telescope to function as a stand-alone instrument that any teacher can reserve and use. (See http:/aloha.gatech.edu for the current status.) The Aloha Telescope has already had educational impact; once fully operational, the facility could substantially impact astronomy education, both in the eastern US and abroad.

K-16 Astronomy Education. For three decades, Jim has been the face of astronomy education at Georgia Tech. Jim unveiled the secrets of the cosmos for thousands of Georgia Tech undergraduates through a series of courses that he developed from scratch on the Solar System, stars (including stellar astrophysics), galaxies, and other astronomical phenomena. A key feature of Jim's courses is a heavy emphasis on exercises and assignments that both deepen astronomical understanding and strengthen oral and written communication skills. Jim's courses are wildly popular because students are drawn by the infectious, enthusiastic way in which Jim conveys his love and passion for astronomy. In addition, Jim has mentored the research efforts of more than 70 undergraduates; he has coauthored research papers with a significant number of undergraduates, some of whom have gone on to become professional astronomers and astrophysicists.

Jim has also played a prominent role in advancing K-12 astronomy education in the Atlanta metro area and across the State of Georgia. Working with Georgia Tech's primary organization for supporting Georgia K-12 STEM education (CEISMC), Jim has created and supported a host of professional development activities (including Aloha Telescope access/usage) and workshops for K-12 teachers. Jim has also been a virtual one-person traveling road show, crisscrossing Georgia to bring nearly a hundred in-person presentations and telescope viewing opportunities to K-12 students. Additionally, well in advance of the COVID pandemic, Jim has been harnessing the power of the Internet to deliver live video astronomical presentations to K-12 students across Georgia and around the world.

Astronomy Public Outreach. For thousands of Atlantans and Georgians, Jim has served as their guide to the mysteries of the heavens. Hundreds of public viewing nights and astronomy open house events over many years have been offered on the Georgia Tech campus at the campus observatory. Jim has been the host at every single one of these events, whose aggregate attendance numbers over 20,000. For more than a decade, Jim conducted adult education evening classes on astronomy with total enrollments in the hundreds. In his capacity as a long-time Scoutmaster, Jim has run numerous Boy Scout Astronomy Merit Badge workshops at the campus observatory. Jim has been a popular speaker on astronomy, both at small gatherings and at large public science-focused events in the Southeast (e.g., the Atlanta Science Festival, the Charleston Science Festival). During the "Great American Eclipse" (August 2017 Solar Eclipse), Jim spearheaded Georgia Tech's public outreach efforts in Atlanta and throughout Georgia. Jim has also authored a popular astronomy book, *The Naked-Eye Sky,* which provides an easy "on-ramp" for people interested in developing observational skills; the book has been used by the Boy Scouts and is featured on the "Recommends List" by the National Science Teachers Association.

In sum, Jim Sowell has demonstrated a lifelong devotion to making the wonders of astronomy readily accessible to the Georgia Tech community and beyond. By any measure, he has been tremendously successful in this mission. His life's work and accomplishments are deserving of the recognition of CTL's 2022 Faculty Award in Academic Outreach. I support, in the strongest possible terms, the nomination of **Dr. James R. Sowell** for this prize and I fully support awarding him that prize.

Sincerely,

Michael F. Schatz
Professor and Interim Chair

James R Sowell, PhD

Faculty Award for Academic Outreach

PASSION FOR ASTRONOMY
James R. Sowell

Passion is the word so often used to describe myself with Astronomy. Something about the view of a wide open, dark night sky has always been inspiring to me. When I was seven, I asked Santa Claus for a "tell – e – scope" in my letter to the North Pole. My early developmental years were in the 1960's with NASA rocket launches, the space competition between the US and USSR, and the "what if" television shows of *Lost in Space* and then *Star Trek*.

My excitement in astronomy only grew from there and ultimately I earned a PhD from the University of Michigan (1986), followed by a post-doc at Georgia State. Then I took a position at GTRI, which was not based in astronomy. While I enjoyed aspects of my time there, it was clearly not the right fit. After a couple of years at GTRI, I contacted and convinced the Interim Chair of Physics, Dr. Henry Valk, that "he needed an astronomer teaching the astronomy classes." I was hired that afternoon, and thus began my astronomical career at Georgia Tech in 1992.

While at Michigan, a conversation with a fellow grad student stuck with me. This student commented that the reason a third student was having a difficult time with course work was because "she came from Georgia Tech where there is no astronomy." I felt I had a mission, not only to Georgia Tech students − so that the comment would never be made again − but also to anyone who had a wonder for celestial objects. In order to improve the basically non-existent Astronomy Program, the first step was obtaining a good telescope and establishing an Observatory.

I. The Campus Observatory

Bringing the dream of an observatory to reality began with receiving a $20,000 grant from the Technology Fee Fund in 2004. This covered the costs of a 16-inch diameter telescope, eyepieces, and accessories. The College of Science and School of Physics then began plans for construction of a very small enclosure on the roof of the Howey Physics Building, a very high location with few obscurations of the sky. However, I wanted a larger facility and secured a $25,000 gift from the Northrop-Grumman company; consequently, the enclosure was expanded to its 30 x 30 ft size. The Observatory's Grand Opening was in April 2007.

Instead of a traditional dome, I opted for a roll-off roof. It has the advantage that many more people can be under the night sky and can simultaneously see the constellation, star, or planet I am identifying. This large roof allows for a second, smaller telescope to also be utilized while having the protection of the building. An additional benefit is the area for holding the roof, when the telescope is uncovered, created a "viewing deck" for small telescopes and for people to see impressive panoramas of the campus and Atlanta.

A significant upgrade occurred in 2014. Dr. Marcus Holzinger, from Aerospace Engineering, offered to use his research funds to purchase a larger telescope in exchange for an Observatory Partnership between the two Schools. A 20-inch diameter telescope from the Italian company, Officina Stellare, and a superb mount replaced the existing telescope, which we donated to the Carnegie Library in Newnan, GA, for public outreach. Now visitors to The Observatory could see fainter objects better. Plus, the telescope's improved pointing accuracy made acquisition and tracking of dim man-made satellites possible. These objects are the AE targets of interest, and that program is now directed by Dr. Brian Gunter.

The Observatory has been actively used since its inauguration, and its outreach and public relations page is at **https://astronomy.gatech.edu/Observatory.php** .

(A) Public Nights are held once a month on a Thursday evening during the academic year. The date always occurs near the lunar phase of First Quarter. This is not only the best time to view the Moon, but even when the weather is less than ideal, there is still the chance of seeing the Moon through the clouds. These events are open to the Atlanta-area public and to the GT community.

(B) Class Nights occur on most Mondays throughout the academic year. This allows opportunities for students in my *The Solar System* (PHYS 2021), *Stars, Galaxies, and the Universe* (PHYS 2022), and *Stellar Astrophysics* (PHYS 3021) courses to have a less-crowded opportunity to view some of the objects they are studying.

(C) Group Nights (private evening viewings) can be arranged in advance. These groups can be on-campus departments, clubs, dorms, or fraternities/sororities. Off-campus entities have included elementary/middle/high school classes, home-school groups, Boy Scout troops, Cub Scout dens, Girl Scout troops, GT Pre-K children, families with autistic teenagers, and others. The composition of the visiting group does not matter, but the size must be between 15 to 40, for the facility cannot handle a larger crowd.

(D) Special Events are dictated by the skies, and these have included lunar eclipses and transits of Mercury and Venus across the Sun.

(E) The GT Astronomy Club, established in 2007, utilizes the facility regularly on Monday evenings. The Club currently has ~250 members on the books, whereas 50 – 60 are active. The Club has hosted events having had over 100 visitors present.

The Observatory is included in ***111 Places in Atlanta That You Must Not Miss*** by Travis Swann Taylor (Chapter 92, 2020).

Due to the pandemic, The Observatory was closed to visitors during 2020 and the first half of 2021. Instead of bringing people to the telescope, we took telescopic views to the people. Five live-stream observations of a variety of celestial objects were shown on the GT Observatory YouTube channel. The technology support was primarily from John Wallom (CoS). The table shows the transmission dates and number of viewers.

May 7, 2020	1,025
May 28, 2020	977
October 22, 2020	546
November 19, 2020	1,099
December 21, 2020	25,850

The December 2020 presentation was of the Jupiter-Saturn conjunction. The audience was world-wide, including some in Canada, the Caribbean, and Japan. For me, these were exhilarating presentations – like being a reporter describing a special event live and on-air. John and I are discussing plans how to again give regularly scheduled broadcasts.

For the current academic year, I have re-opened The Observatory to visitors. One change, though, is that the Public Nights now occur on the grounds between the Howey and Mason Buildings. We bring several telescopes down from The Observatory and get Facilities to turn off the nearby lights. This allows for easier accessibility, better social distancing, and improved crowd control, for often these events have more than 200 visitors.

A summary of the annual use of The Observatory is given in the table below:

Calendar Year	Visitors	Nights Open	Nights Clouded Out
2008	1020	55	14
2009	1669	54	14
2010	1981	57	12
2011	1077	39	26
2012	2461	49	14
2013	1561	42	15
2014	1539	41	8
2015	1502	43	25
2016	1775	43	15
2017	1859	30	14
2018	1912	31	14
2019	1468	46	19
2020	0	0	0
2021	773	13	8
Total	**20500**	**530**	**198**

Besides bringing the utilization back to pre-pandemic levels, future plans are to re-institute some form of online YouTube presentations and to begin/sustain a student Astro-Photography group.

II. The *Aloha Telescope* in Maui

"How does one bring night time astronomical viewing of celestial objects into a daytime classroom?"

Astronomy, especially when studied in daytime classrooms, has a distinct disadvantage. I realized the solution to this dilemma was to operate a remote telescope in a time zone far from Atlanta where it would still be dark during our mornings. With a video camera on the telescope and streamed images, then K-12 students in Georgia could see live views of the Moon's surface. After an international search for a site, eventually the Air Force Research Lab (AFRL) in Maui agreed to work as a partner in 2013. AFRL supplied an 11-inch diameter telescope, pier, dome, and a secure site, which is not on the 10,000-foot summit but on the AFRL fenced grounds half a mile from the ocean. Georgia Tech manages the software development, internet telecommunications, usage, teacher training, proposal writing, advertisement, and K-12 presentations. A five-year *Education Partnership Agreement* (EPA) was signed with the AFRL in 2014, and it was renewed in 2019.

It did not take me long to realize that *The Aloha Telescope* is not as simple as a webcam with a 4,500-mile-long cable. Telecommunication avenues and remote-control software were developed over several years. Often the development pace was slow due to the great distance and the rarity of maintenance trips. The expertise of Thomas Crowley (retired, uncompensated consultant), Dr. Warren Matthews (formerly of GTRI and D2D), and John Wallom (Physics and CoS IT) solved many issues. Financial support came from the School of Physics ($25,000) and Francis Wood Wilson Foundation ($20,000), along with eight weeks of on-site support for myself through the Air Force Summer Faculty Program in 2018.

The facility was functioning in 2018, and during the next two years I gave in-person demonstrations to seven middle or elementary schools. Live views of the Moon were displayed and described, and many of the

students were able to move the telescope across the lunar surface with the controlling laptop computer. More than 400 4th and 6th grade students were present. A documentary of *The Aloha Telescope* was produced by Georgia State University television. **https://www.youtube.com/watch?v=UIwf7hEnmjY**

Through the GTRI *Direct2Discovery* (D2D) K-12 outreach program, *The Aloha Telescope* will soon be re-introduced to the local area school districts. Although its remote capability would have seemed to be ideal for use during the past two years with many students attending school remotely, rather the teachers were so busy and over worked handling multiple, fluid situations that they were not ready for outside presentations. The plan is for us to be extremely active during the Spring, for that is when most 6th grade educators teach the Astronomy component.

III. Variety of K-12 and General Public Outreach Programs

In collaboration with Jean Anderson (now retired from CEISMC), we developed and conducted "Hawaiian Eye" Teacher's Workshops to not only improve the teachers' background in astronomy but to also prepare them for using the *Aloha Telescope*. There were ~80 teachers in the four workshops (during 2013-17), which were made possible by more than $200,000 in funding from the Georgia Improving Teacher Quality Grant Program. The video **https://www.youtube.com/watch?v=-XlpoyfPmLg** was filmed and produced by CEISMC during one of the Teacher Workshops. Several of the educators show their excitement about being able to use the soon-to-be available *Aloha Telescope*.

For decades I have had the pleasure of giving astronomical presentations to more than 60 school groups, primarily 4th and 6th grade classrooms, or leading a Telescopic Viewing evening event, and better than 4,500 students have experienced one or both types of interactions. For the presentations, the students have seen recent images of Solar System objects and heard about what currently excites scientists. The greatest delight, for both the students and myself, are the Q&A sessions. Some of the most frequent questions are about black holes and aliens! The telescope views are usually of the Moon, and it is easy to tell when they – or their parents – see the magnified view of the surface features, for they let out a squeal of delight!

Using online capabilities, presentations have included sending live views during our nights from The Observatory to schools in Australia, Great Britain, and Texas. With D2D, daytime addresses and inter-actions with local-area schools and classrooms are occurring.

Prior to the pandemic, through nine Saturday workshops that included the use of The Observatory, more than 600 Boy Scouts have worked on the Astronomy Merit Badge.

A *Popular Astronomy* course was taught via the *Evening at Emory* University Community Outreach program during the 1990's. The class introduced adults to the night sky and naked-eye phenomena. The course was held either on the Emory campus or at Stone Mountain Park for darker skies. I taught this course about 30 times during 10 years to over 500 adults.

Finally, I have been invited to events outside of Georgia. I provided solar viewings to two Charleston, SC, STEM Festivals in 2015-16. This past October, I lead a Star Party at St. George Island State Park, FL, where about 60 adults saw dazzling views of Jupiter and Saturn through a Georgia Tech telescope!

Edwin Greco
Senior Academic Professional, School of Physics
837 State Street, Georgia Institute of Technology
Atlanta, Georgia 30332-0430, U.S.A.
Email: ed.greco@gatech.edu
Phone: 404-3825-3928, Fax: 404-894-9958

February 3rd 2022

To the Center for Teaching and Learning Awards Committee,

It is with great pleasure that I write this letter of support for Dr. Jim Sowell's nomination for the Georgia Tech CTL Outreach Award. I have known Jim for more than 20 years, first as a GT student and now as a fellow faculty member in physics. In that time, I have witnessed his unparalleled dedication to astronomy outreach both on and off the GT campus. He serves as a role model to many of us here in physics, and I can not think of another faculty member more deserving of this recognition.

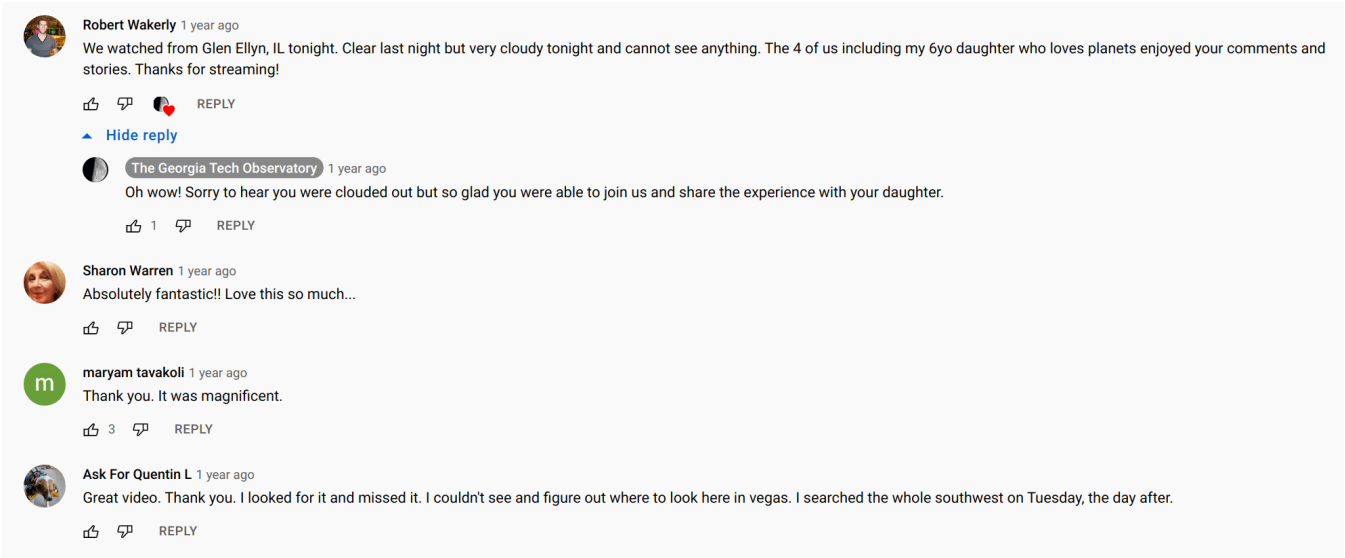
I first met Jim as a graduate student working in graduate student government. Jim was working hard to secure funding for a telescope to fulfill his dream of opening an observatory at Tech. He wanted a place on campus that could serve as a beacon of science outreach to the Atlanta community. He was successful and in 2008 the observatory opened on the roof of the Howey building. I recall many skeptics who wondered aloud if anyone might drive to our campus to look into a sky aglow with light pollution. That first year, and every year since, more than 1000 people of all ages and interests made the trek to the Howey rooftop.

If the observatory was only an unmanned telescope open to the public I am not sure it would see much use. What really makes the Tech observatory special is the passion for astronomy that Jim imbues into each of his 50+ observatory nights. Astronomy outreach is uniquely demanding in that it is often performed between 8pm - 11pm in the evening. I know of no other faculty member on our campus who has volunteered that many evenings sharing their passion for science to Atlantans of all ages. This is to say nothing of the countless hours Jim spends promoting the observatory or working to secure funding for upgrades or equipment repairs.

Who attends Jim's public nights? Tech students, Faculty and Staff, Boy Scout troops, PreK classes, retirees, school teachers, you name a demographic and I am sure they have visited Tech's observatory to learn about the Moon, our neighboring planets and stars, and the cosmos at large. How do you measure the impact that has had on our city? More than 20,000 people have stepped up to peep through one of Jim's eyepieces but that number could have easily been doubled or tripled if the observatory space was larger or Jim required less sleep. Nearly every public night is filled to capacity with a line that stretches up the stairs to the top of Howey.

Edwin Greco
Senior Academic Professional, School of Physics
837 State Street, Georgia Institute of Technology
Atlanta, Georgia 30332-0430, U.S.A.
Email: ed.greco@gatech.edu
Phone: 404-3825-3928, Fax: 404-894-9958

A year into the covid pandemic, it was clear to Jim that there was still a demand for observational astronomy. With the volunteer help of a college of science IT professional, Jim created a YouTube channel to host live viewing parties a few dozen times a year. These watch parties turned out to be wildly popular, with more than 25,000 viewers tuning in to watch the Jupiter-Saturn conjunction. As a result of these events, Jim's YouTube channel now has more subscribers than the GT College of Sciences. A few representative comments are shared below:



Robert Wakerly 1 year ago
We watched from Glen Ellyn, IL tonight. Clear last night but very cloudy tonight and cannot see anything. The 4 of us including my 6yo daughter who loves planets enjoyed your comments and stories. Thanks for streaming!
REPLY
Hide reply
The Georgia Tech Observatory 1 year ago
Oh wow! Sorry to hear you were clouded out but so glad you were able to join us and share the experience with your daughter.
1 REPLY

Sharon Warren 1 year ago
Absolutely fantastic!! Love this so much...
REPLY

maryam tavakoli 1 year ago
Thank you. It was magnificent.
3 REPLY

Ask For Quentin L 1 year ago
Great video. Thank you. I looked for it and missed it. I couldn't see and figure out where to look here in vegas. I searched the whole southwest on Tuesday, the day after.
REPLY

It is for all these reasons that I give Dr. Jim Sowell my highest recommendation for the CTL Outreach Award. It is my belief that honoring Jim recognizes 30 years of service to GT and encourages other faculty to follow in his example of service to Tech, Atlanta, and the state of Georgia.

Sincerely,

Edwin Greco, PhD.
Senior Academic Professional
School of Physics

February 1, 2022

Jean F. Anderson, EDS
691 Willivee Drive
Decatur, Georgia 30033
Jeananderson81@gmail.com

Center for Teaching and Learning – Georgia Tech
Georgia Institute of Technology
Atlanta, Georgia

Greetings CTL Outreach Awards Committee,

It is with great pleasure that I am writing to support the nomination of Dr. James R. Sowell, School of Physics, Georgia Tech, for the CTL Outreach Award. I met Dr. Sowell over 15 years ago while working at Georgia Tech's *Center for Education Integrating Science, Mathematics, and Computing* (CEISMC). We worked on several K-12 educational projects together. Working with Jim, I discovered his enthusiasm and love of sharing his passion for astronomy to all – K-12 teachers and students, higher education students, and the general public. I had the honor of working with Jim over the next decade plus to help improve, involve, integrate, and develop the understanding of STEM knowledge relating to astronomy. I was a Math Coordinator for the DeKalb County School System (Decatur, GA) and when I retired from the school system, a Program Director providing K-12 professional development support for CEISMC. Dr. Sowell, the teachers, and I discovered many connections in all STEM areas. Dr. Sowell took the lead to provide enriching, high quality outreach and professional development for the K-12 educators. This support provided long-term effects for the larger education community beyond the Georgia Tech campus.

Dr. Sowell worked tirelessly in support of K-12 educators by writing, submitting, and implementing Georgia Teacher Quality Grants to over 80 participants over a five year period. He supported these teachers throughout the year by visiting their classrooms when requested and provided follow up from summer workshops. Dr. Sowell was active in providing hands on, real world connections during these sessions. This

included classroom materials, literature connections, and web/internet support. The teachers were active and excited. We had the pleasure of taking the teachers to North Georgia for an overnight trip to Young Harris College for the culminating adventure to observe the universe and the stars as could not be seen from the city of Atlanta. I wish you could read the evaluation comments regarding Dr. Sowell from these teachers.

Dr. Sowell also provided support to K-12 classrooms in Georgia and South Carolina. He provided presentations to school groups, classrooms, STEM Festivals, and the general public at his Astronomy Nights on Georgia Tech's campus. He supported CEISMC continually through presentations at Math Science Partnerships (MSP) and providing leadership for the Science Olympiad at Georgia Tech. He was the Earth and Space Science Cluster Coordinator for 2015 and 2016. He helped create Science Olympiad activities, write tests, and supported the students monitoring the activities for hundreds of Georgia high school students.

I could go on and on, but in summary, Dr. Jim Sowell should be recognized for his outstanding support and contributions to the education of the public, K-12 educators and students. His efforts, in addition to his regular duties at Georgia Tech, have inspired me and others to look at the universe and our world more knowledgeably and with more enthusiasm. This gift will continue to ripple through out education in Georgia and beyond and provide benefits for future generations of learners.

Best regards,
Jean

Jean F. Anderson, EDS
Retired educator and Instructional Coordinator (Dekalb County School System, Decatur, GA)
Retired Program Director (CEISMC)
Jeananderson81@gmail.com