

## Accomplishments – 2020 – Patricia H. Reiff, Rice University

### Major accomplishments:

1. Continued work on pathbreaking MMS mission. Paper (Webster et al., 2020) on flux ropes published in JGR with many citations. Andrew Marshall paper published and one more in review.
2. Major outreach program goes mostly virtual but still reached over 6000 in person and more than 50 virtual lectures and events. Hosted 46 live free zoom planetarium shows with live commentary and Q&A. White paper on zooming planetarium shows written and posted.
3. “Reach for the Stars” Festival for 2020 postponed but is being considered for 2021 – writeup published in “Rice at Large”.
4. Several keynote and invited talks (Texas APS, Solar Week, Ham clubs – see list)
5. Several media appearances (see list)
6. Hosted “launch watch party” for alumna Shannon Walker on first crewed SpaceX vehicle.

### Invited Talks

- MMS Virtual Team meeting, April
- “Is another Carrington Coming?” Texas Division of APS, November 13.
- “The Sun and Space Weather”, Talk for Katy Amateur Radio Society, Nov 9, <https://youtu.be/kiccwLwjFc>

### Media Appearances/Articles:

1. Trip to South Texas Hispanic schools for NASA Space Science Days featured: <https://www.valleycentral.com/news/local-news/nasa-scientists-visit-san-benito-high-school/>
2. Article “Girls Learn to Reach for the Stars” in “Rice at Large” : <https://publicaffairs.rice.edu/sites/g/files/bxs2671/files/inline-files/RALwinter20.pdf>
3. Space constellations: radio/web interview: <https://ktrh.iheart.com/content/2020-08-12-thousands-and-thousands-and-thousands-of-new-satellites/>
4. The new sunspot cycle has begun (Houston Chronicle, Sept 17, 2020) <https://www.houstonchronicle.com/news/houston-texas/space/article/When-the-sun-s-north-and-south-poles-swap-15569087.php?cmpid=gsa-chron-result>
5. Commentary on Arecibo radio observatory collapse: <https://www.houstonchronicle.com/news/houston-texas/space/article/Video-shows-the-Arecibo-Observatory-s-collapse-15772841.php>

### Keynote Speaker

- STEM conference, Springfield Missouri March 27-28 (Cancelled due to COVID)
- “Space Weather, COBRA, and the Magnetospheric Multiscale Mission (MMS)”, keynote for Solar Week, October 15 (Via Zoom), <https://www.youtube.com/watch?v=4saYpQlet0g>
- “The Sun and Space Weather”, Keynote Talk for Rice Gulf Coast Undergraduate Research Symposium (GCURS), October 31 (via Zoom)

## Lectures/Conferences

1. "Teaching Magnetospheric Physics", Colloquium, LASP (virtual). Available from: <https://youtu.be/smax6UsjoqA>, (9/29/20)
2. "Space Weather, COBRA, and Rice", Talk for Rice Homecoming "Owl Together", October 26 (via Zoom).
3. "The Sun and Space Weather", Talk for Katy Amateur Radio Society, <https://youtu.be/kiccwcLwjFc>, (11/12/2020)
4. 3 papers, fall AGU 2020 meeting (virtual)

## Publications

Marshall, A. T., J. L. Burch, P. H. Reiff, J. M. Webster, R. B. Torbert, R. E. Ergun, et al. Asymmetric reconnection within a flux rope-type dipolarization front. *J. Geophys Res: Space Physics*, **125**, e2019JA027296. <https://doi.org/10.1029/2019JA027296> (2020).

Reiff, P. H., "Girls Learn to Reach for the Stars", Article, "Rice At Large" Winter 2020, <https://publicaffairs.rice.edu/sites/g/files/bxs2671/files/inline-files/RALwinter20.pdf>

Farrugia, C. J., A. Rogers, R. B. Torbert, K. J. Genestreti, T. Nakamura, B. Lavraud, P. Montag, J. Egedal, D. Payne, A. M. Keesee, N. Ahmadi, R. E. Ergun, P. H. Reiff, M. R. Argall, H. Matsui, L. B. Wilson, N. Lugaz, J. L. Burch, C. T. Russell, S. A. Fuselier, and I. Dors, "An Encounter with the Ion and Electron Diffusion Regions at a Flapping and Twisted Tail Current Sheet", (in review), *Journal of Geophysical Research*, (2020).

Reiff, P. H. and C. C. Law, "Portable Planetariums in the Age of COVID\_19", [http://www.eplanetarium.com/publications/Portable\\_Planetariums\\_in\\_the\\_Age\\_of\\_Covid.pdf](http://www.eplanetarium.com/publications/Portable_Planetariums_in_the_Age_of_Covid.pdf).

Reiff, P. H., C. C. Law, and C. T. Sumners, "Streaming Subtitled Videos (including fulldome planetarium shows) via Zoom", [http://www.eplanetarium.com/publications/Streaming\\_subtitled\\_video\\_via\\_Zoom.pdf](http://www.eplanetarium.com/publications/Streaming_subtitled_video_via_Zoom.pdf).

Webster, J.M., J. L. Burch, P. H. Reiff, K. J. Genestreti, R. E. Denton, R. B. Torbert, H. Hasegawa, K.-J. Hwang, K. Dokgo, S. Hoilijoki, A. Marshall, W. Li, S. Y. Sazykin, Instabilities Associated with Electron-Scale X-line Evolution, <https://agu2020fallmeeting-agu.ipostersessions.com/?s=4D-43-BC-24-D9-F2-E4-91-06-7B-6F-FA-BB-68-CB-17&token=evES2pnkbBWitLaqhlOSEJck8IPGrqNQkZwsEp2tSqw>.

Marshall, A, J L Burch, P H Reiff, J L Webster, R E Denton and M R Argall, "Wave Activity in a Reconnection Current Sheet near an X-Line on the Dayside Magnetopause", <https://agu2020fallmeeting-agu.ipostersessions.com/default.aspx?s=FA-6D-60-EC-B6-1A-99-E4-C6-29-04-6E-CC-61-AF-01>

Reiff, P. H., L. Rastaetter, J. Webster, A. Marshall, S. Sazykin, and A. Glocer, “CCMC Modeling of MMS Dayside Reconnection Events”, [https://agu2020fallmeeting-  
agu.ipostersessions.com/default.aspx?s=D1-DB-EB-89-33-11-55-96-20-89-23-35-A1-  
7A-F6-86](https://agu2020fallmeeting-<br/>agu.ipostersessions.com/default.aspx?s=D1-DB-EB-89-33-11-55-96-20-89-23-35-A1-<br/>7A-F6-86)

Chappell, R., J. L. Burch, P. H. Reiff and Jackie Reasoner, “Brian J. O’Brien: From the Earth to the Moon”, in *The Impact of Lunar Dust on Human Exploration*, Ed. J. S. Levine, Cambridge Press, ISBN 1-5275-6308-1, (in press, 2020).

## Outreach Events

2020			Students	Public	Teachers
Jan-April	ASTR 503 “Astronomy for Teachers” Course	Rice University	0	0	9
Jan 14-15	NASA Space Science Day (Discovery Dome at 99%+ Hispanic schools)	Collins Parr Elementary School (San Diego, TX)	510	180	22
Jan 16	NASA Space Science Day (Discovery Dome at 99%+ Hispanic schools)	Santa Rosa High School (Santa Rosa, TX)	560	90	20
Jan 17	NASA Space Science Day (Discovery Dome at 99%+ Hispanic schools)	San Benito High School (San Benito, TX)	280	0	16
2/1	Astronomy Open House	Rice University	16	33	3
3/23 – 27	“Solar Week” (SME at four online hangouts)	Sponsored by Berkeley	40	120	0
March-May	Several online software trainings (Stellarium, Space Update, Space Weather, etc)	Rice University	0	0	96
4/22/20	“Force 5” online show	show w/ commentary	2	24	0
4/29/20	Earth's Wild Ride	show w/ commentary	8	156	0
5/6/20	Dinosaur Prophecy	show w/ commentary	8	97	0
5/13/20	Impact!	show w/ commentary	22	170	0
5/20/20	We Choose Space	show w/ commentary	10	122	0
5/27/20	Launch America	show w/ commentary	40	289	0
5/27/20	Great Planet Adventures	show w/ commentary	16	115	0
5/28/20	Night Sky TONIGHT	Online star show	0	27	0
5/30/20	Launch America (RESCHED)	show w/ commentary	112	423	0
6/3/20	Magnetism	show w/ commentary	4	111	0
6/4/20	Night Sky TONIGHT	Online star show	2	47	0
6/10/20	Apollo and Beyond	show w/ commentary	8	66	0
6/11/20	Night Sky TONIGHT	Online star show	6	30	0
6/17/20	It's About Time	show w/ commentary	10	95	0
6/18/20	Night Sky TONIGHT	Online star show	0	42	0
6/20/20	Solstice at the Sundial* *Note includes 27 in person	Live event at HMNS and online	12	45	0
6/24/20	Impact Earth	show w/ commentary	3	60	0
6/25/20	Night Sky TONIGHT: prepare for Mars	Online star show	3	34	0
7/1/20	Search for Life in the Universe	show w/ commentary	6	62	0
7/1/20	Search for Life - Spanish	show w/ commentary	3	12	0
7/2/20	Night Sky TONIGHT - Mars 1	Online star show	4	24	0

7/8/20	Amazing Astronomers	show w/ commentary	6	38	0
7/8/20	Amazing Astronomers - Spanish	show w/ commentary	1	12	0
7/9/20	Night Sky TONIGHT - Mars 2	Online star show	4	22	0
7/15/20	Secrets of the Dead Sea	show w/ commentary	4	39	0
7/15/20	Secrets of the Dead Sea - Spanish	show w/ commentary	1	11	0
7/16/20	Night Sky TONIGHT - Mars 3	Online star show	4	21	0
7/22/20	Fate of the Maya	show w/ commentary	7	37	0
7/22/20	Fate of the Maya - Spanish	show w/ commentary	2	11	0
7/23/20	Night Sky TONIGHT - Mars 4	Live online sky show	4	29	0
7/29/20	Night of the Titanic	show w/ commentary	5	38	0
7/29/20	Night of the Titanic - Spanish	show w/ commentary	2	12	0
7/30/20	Perseverance Launch Party	Live event	10	193	0
7/30/20	Night Sky TONIGHT	Live online sky show	4	31	0
8/5/20	X-Planets	show w/ commentary	6	28	0
8/5/20	X-Planets - Spanish	show w/ commentary	0	7	0
8/6/20	Night Sky TONIGHT	Live online sky show	6	19	0
8/12/20	Force 5 (repeat for hurricane season)	show w/ commentary	2	25	0
8/12/20	Force 5 - Spanish	show w/ commentary	1	10	0
8/13/20	Night Sky TONIGHT	Live online sky show	2	15	0
8/19/20	Great Planet Adventures (Kids)	show w/ commentary	3	12	0
8/19/20	Great Planet Adventures - Spanish	show w/ commentary	1	2	0
8/20/20	Night Sky TONIGHT	Live online sky show	2	7	0
8/26/20	Ice Worlds English	show w/ commentary	3	24	0
8/26/20	Ice Worlds - Spanish	show w/ commentary	0	7	0
8/28/20	Night Sky TONIGHT	Live online sky show	3	26	0
Aug-Dec	"Physics of Ham Radio" Class		0	0	12
Nov 14-15	Crew-1 Launch watch Party	Shannon Walker launch to ISS	159	0	4
Nov 18/19	Virtual Planetarium Workshop on the conjunction (HMNS)	Live school/teacher show (3 sessions)	140	0	22
Dec 1-2	Solar System Workshop	Live teacher workshop on solar system mechanics (2 sessions)			24
Dec 21	Jupiter/Saturn Conjunction observing	HMNS public event		35	3
	<b>TOTALS</b>		<b>5645</b>	<b>2207</b>	<b>3185</b>
				<b>3185</b>	<b>253</b>

**Total reached in person** in public talks, online or outreach events: 3,967  
(not including media appearances, lectures or dome events)  
Total in dome events (in person) 1,678  
Total in keynote, conference and invited lectures 380  
Total reached in person (includes virtual events) **6,025**