

Resources, Websites for “Electrostatics and Space”

Is Space Empty?:

How to Build a Cloud Chamber

https://video.search.yahoo.com/yhs/search;_ylt=AwrC5rJgZdtZQ38Alak0nllQ;_ylu=X3oDMTBncGdyMzQ0BHNIYwNzZWfyY2gEdnRpZAM-;_ylc=X1MDMTM1MTE5NTcwMARfcgMyBGfjdG4DY2xrBGJjawNhc21rYjAxY3JoN2NjJTl2YiUzRDMIMjZzJTNEcTYEY3NyY3B2aWQDRk10SVBERXdMakd1V29zQVdiaWRqQUtXTWpZd01RQUFBQUQzbyZrUQRmcgN5aHMtaXRtLTAwMQRmcjIDc2EtZ3AEZ3ByaWQDWHFMRlc4REhRdDlzS2pfcjk2OE1qQQRtdGVzdGkA251bGwEbl9yc2x0AzYwBG5fc3VnZwMxMARvcmlnaW4DdmlkZW8uc2VhcmNoLnlhaG9vLmNvbQRwb3MDMgRwcXN0cgNjbG91ZCBjaGFtYmVyBHBxc3RybAMxMwRxc3RybAMyOARxdWVyeQNob3cqdG8gYnVpbGQgYSBjbG91ZCBjaGFtYmVyBHRfc3RtcAMxNTA3NTUwOTM4BHZ0ZXN0aWQDbnVsbA--?gprid=XqLFW8DHQt23Kj_r968MjA&pvid=FMtIPDEwLjGuWosAWbidjAKWMjYwMQAAAAD3n6kQ&p=how+to+build+a+cloud+chamber&ei=UTF-8&fr2=p%3As%2Cv%3Av%2Cm%3Asa&fr=yhs-itm-001&hsimp=yhs-001&hspart=itm&type=mnn_fmr_17_37#id=1&vid=16000be7ae2e14465947583b5fd626c3&action=view

How to Make a Cloud Chamber (In a plastic cup)

https://video.search.yahoo.com/yhs/search;_ylt=A0LEVvVSZdtZ8isAXRwPxQt.?p=cloud+chamber+in+a+jar&fr=yhs-itm-001&fr2=piv-web&hspart=itm&hsimp=yhs-001&type=mnn_fmr_17_37#id=3&vid=8d29be9080a0ccbcdbc4b8c0461368cf&action=view

Particles in the Mist

<http://physicsopenlab.org/2017/05/18/particles-in-the-mist/>

Secrets of the Sun, NOVA video

https://www.youtube.com/watch?v=byAXokzLE_4

Solar and Heliospheric Observatory:

<https://sohowww.nascom.nasa.gov/>

Solar Dynamics Observatory:

<https://sdo.gsfc.nasa.gov/>

Aurora:

Aurora Tutorial - Dawn of the North

http://sprg.ssl.berkeley.edu/aurora_rocket/aurora/

Aurora Tutorial Analogs - Television in the Sky - Comparing Aurora to Cathode Ray Tubes

http://sprg.ssl.berkeley.edu/aurora_rocket/education/crt/index.htm

How to Build a Magnetometer (2 min 28 sec)
<https://www.youtube.com/watch?v=qvHzprMSjXA>

The Electric Atmosphere
https://www.nasa.gov/mission_pages/rbsp/news/electric-atmosphere.html

Electric Fields:

Khan Academy – Electric Field
<https://www.khanacademy.org/science/physics/electric-charge-electric-force-and-voltage/electric-field/v/electrostatics-part-2>

What is Electrostatics? (Inductive and Conductive Charges) (Classic Video)
https://www.youtube.com/watch?v=6_HI1g_InK0

Crash Course in Electricity:
https://video.search.yahoo.com/yhs/search;_ylt=A0LEVvDr.ctZWgkAFF0PxQt.?p=physiological+effect+of+electrostatic+charges+to+humans&fr=yhs-iry-fullyhosted_003&fr2=piv-web&hspart=iry&hsimp=yhs-fullyhosted_003&type=mnn_fmr_17_37#id=2&vid=9b3c21e42ce746755f3b3729882b59b8&action=view

PVC Static Electricity Experiments:
<https://video.search.yahoo.com/yhs/search?fr=yhs-itm-001&hsimp=yhs-001&hspart=itm&p=how+to+demonstrate+electrostatics#id=5&vid=8534ccebdc435de798f20f18bf4be318&action=click>

9 Awesome Science Tricks Using Static Electricity:
<https://www.youtube.com/watch?v=ViZNgU-Yt-Y>

Charged Knitting Needle in Space with Water Droplets: (frist 5 min of video)
https://www.youtube.com/watch?time_continue=253&v=v8Jf1YUt89w

Cosmic rays: particles from space
<https://home.cern/about/physics/cosmic-rays-particles-outer-space>

Electrostatic Effects on Equipment in Space:

Magnetometer in a Plastic Bottle
<http://lasp.colorado.edu/home/wp-content/uploads/2011/08/magnetometer.pdf>

Physiological Effects of Space on Humans:

Understanding Space Radiation:
<https://spaceflight.nasa.gov/spaceneeds/factsheets/pdfs/radiation.pdf>

Radiation Counter Measures:
https://www.nasa.gov/pdf/284275main_Radiation_HS_Mod3.pdf

Meeting the Grand Challenge of Protecting an Astronaut's Health: Electrostatic Active Space Radiation:

https://www.nasa.gov/pdf/637128main_Tripathi_Presentation.pdf

Anomalous Long Term Effects on Astronauts Central Nervous Systems (ALTEA)

https://www.nasa.gov/mission_pages/station/research/experiments/137.html

Radiation Effects on Electronics 101:

https://nepp.nasa.gov/DocUploads/392333B0-7A48-4A04-A3A72B0B1DD73343/Rad_Effects_101_WebEx.pdf

The biological effects associated with X-rays, risk and practical radiation protection

<https://pocketdentistry.com/7-the-biological-effects-associated-with-x-rays-risk-and-practical-radiation-protection/>

Bodner Research Web: Ionizing Radiation

<http://chemed.chem.purdue.edu/genchem/topicreview/bp/ch23/radiation.php>

Could We Survive Prolonged Space Travel?

https://www.youtube.com/watch?time_continue=26&v=upp9-w6GPhU

Radiation protection in space - umu.se

http://www.tp.umu.se/space/Proj_10/Daniel_H-10.pdf

Articles and Books:

R.A. Mewaldt; et al. (2005-08-03). "The Cosmic Ray Radiation Dose in Interplanetary Space – Present Day and Worst-Case Evaluations" (PDF). 29th International Cosmic Ray Conference Pune (2005) 00, 101-104. p. 103. Retrieved 8 March 2008.

John Dudley Miller (November 2007). "Radiation Redux". Scientific American.

Space Studies Board and Division on Engineering and Physical Sciences, National Academy of Sciences (2006). "Space Radiation Hazards and the Vision for Space Exploration". NAP.

Moreno-Villanueva, M.; Wong, M.; Lu, T.; Zhang, Y. & Wu, H. (2017). "Interplay of space radiation and microgravity in DNA damage and DNA damage response". Npj Microgravity. 3 (14). doi:10.1038/s41526-017-0019-7.

Bennett PV, Cutter NC, Sutherland BM (Jun 2007). "Split-dose exposures versus dual ion exposure in human cell neoplastic transformation". *Radiat Environ Biophys.* 46 (2): 119–23. PMID 17256176. doi:10.1007/s00411-006-0091-y.

Jump up ^ Scott, Jim (30 September 2017). "Large solar storm sparks global aurora and doubles radiation levels on the martian surface". *Phys.org*. Retrieved 30 September 2017.

Jump up ^ Vazquez, M.E. (1998). "Neurobiological problems in long-term deep space flights". *Adv. Space Res.* 22 (2): 171–173. Bibcode:1998AdSpR..22..171V. doi:10.1016/S0273-1177(98)80009-4.

Blakely, E.A.; Chang, P.Y. (2007). "A review of ground-based heavy ion radiobiology relevant to space radiation risk assessment: Cataracts and CNS effects". *Adv. Space Res.* 40 (9): 1307–1319. Bibcode:2007AdSpR..40.1307B. doi:10.1016/j.asr.2007.03.070.

Hellweg, CE; Baumstark-Kahn, C (2007). "Getting ready for the manned mission to Mars: the astronauts' risk from space radiation". *Naturwissenschaften.* 94 (7): 517–519. Bibcode:2007NW.....94..517H. PMID 17235598. doi:10.1007/s00114-006-0204-0.

Badwhar, G.D.; Nachtwey, D.S. & Yang, T.C.-H. (1992). "Radiation issues for piloted Mars mission". *Adv. Space Res.* 12 (2–3): 195–200. Bibcode:1992AdSpR..12R.195B. PMID 11537008. doi:10.1016/0273-1177(92)90108-A.

Cucinotta, F.A.; Nikjoo, H. & Goodhead, D.T. (1988). "The effects of delta rays on the number of particle-track traversals per cell in laboratory and space exposures". *Radiat. Res.* 150: 115–119. Jump up ^ Curtis, S.B.; Vazquez, M.E.; Wilson, J.W.; Atwell, W.; Kim, M. & Capala, J. (1988). "Cosmic ray hit frequencies in critical sites in the central nervous system". *Adv. Space Res.* 22 (2): 197–207. Bibcode:1998AdSpR..22..197C. PMID 11541397. doi:10.1016/S0273-1177(98)80011-2.

Pinsky, L.S.; Osborne, W.Z.; Bailey, J.V.; Benson, R.E. & Thompson, L.F. (1974). "Light flashes observed by astronauts on Apollo 11 through Apollo 17". *Science.* 183 (4128): 957–959. Bibcode:1974Sci...183..957P. doi:10.1126/science.183.4128.957.

McNulty, P.J.; Pease, V.P. & Bond, V.P. (1975). "Visual Sensations Induced by Cerenkov Radiation". *Science.* 189 (4201): 453–454. Bibcode:1975Sci...189..453M. doi:10.1126/science.1154020.

McNulty, P.J.; Pease, V.P.; Bond, V.P. (1977). "Comparison of the light-flash phenomena observed in space and in laboratory experiments". *Life Sci. Space Res.* 15: 135–140. doi:10.2172/7312082.

Tobias, C.A.; Budinger, T.F.; Lyman, J.T. (1973). "Biological effects due to single accelerated heavy particles and the problems of nervous system exposure in space". *Life Sci. Space Res.* 11: 233–245. doi:10.2172/4617388.

Cherry, Jonathan D.; Frost, Jeffrey L.; Lemere, Cynthia A.; Williams, Jacqueline P.; Olschowka, John A.; O'Banion, M. Kerry (2012). "Galactic Cosmic Radiation Leads to Cognitive Impairment and Increased A β Plaque Accumulation in a Mouse Model of Alzheimer's Disease". *Plos One.* 7 (12): e53275. Bibcode:2012PLoSO...753275C. PMC 3534034 Freely accessible. PMID 23300905. doi:10.1371/journal.pone.0053275. Retrieved 7 January 2013.

Staff (1 January 2013). "Study Shows that Space Travel is Harmful to the Brain and Could Accelerate Onset of Alzheimer's". *SpaceRef*. Retrieved 7 January 2013.

Jump up ^ Cowing, Keith (3 January 2013). "Important Research Results NASA Is Not Talking About (Update)". *NASA Watch*. Retrieved 7 January 2013.

^ Jump up to: a b NASA SP-413 Space Settlements: A Design Study. Appendix E Mass Shielding Retrieved 3 May 2011.

^ Jump up to: a b c d e G.Landis (1991). "Magnetic Radiation Shielding: An Idea Whose Time Has Returned?".

Jump up ^ Rebecca Boyle (13 July 2010). "Juno Probe, Built to Study Jupiter's Radiation Belt, Gets A Titanium Suit of Interplanetary Armor". *Popular Science*.

Jump up ^ "NASA - Plastic Spaceships". *science.nasa.gov*. Retrieved 2 April 2017.

Jump up ^ "Cosmic rays may prevent long-haul space travel". *New Scientist*. 1 August 2005. Retrieved 2 April 2017.

Jump up ^ Morgan, P. (2011) "To Hitch a Ride to Mars, Just Flag Down an Asteroid" *Discover magazine blog*