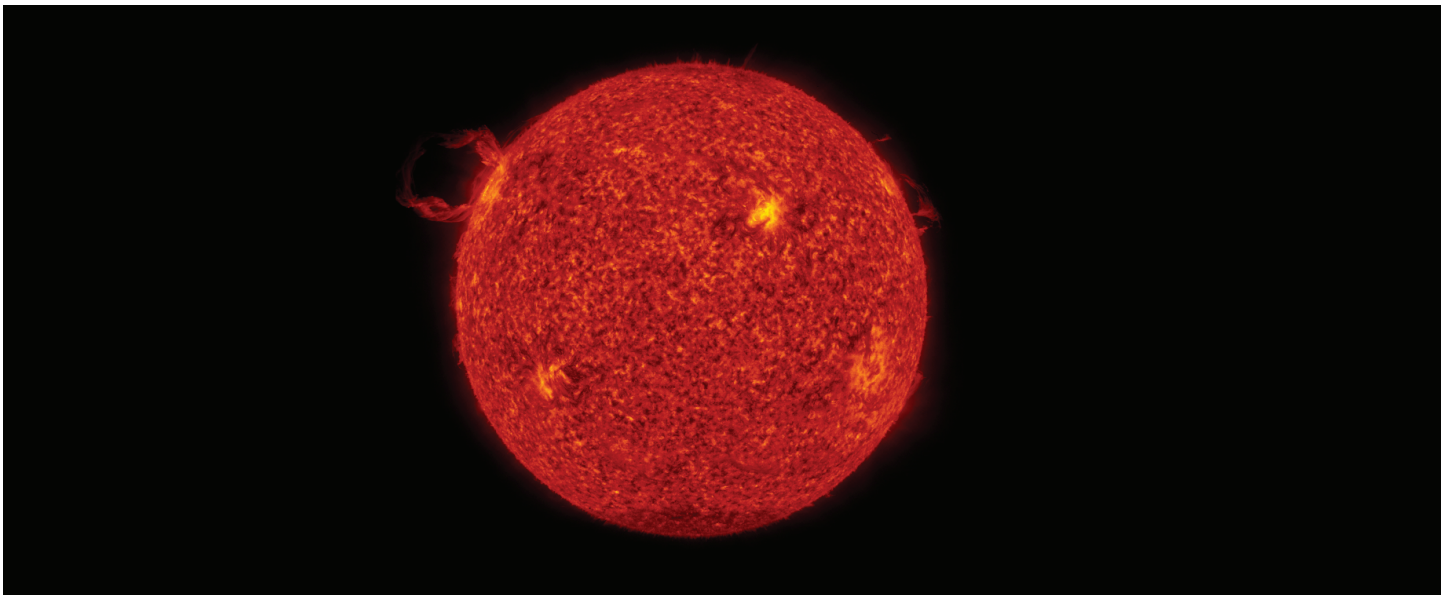
Goddard Tech 12

Each month the Strategic Partnerships Office will tell the story of a renowned innovator at NASA's Goddard Space Flight Center and show how their technological breakthroughs are brought from the labs to our lives. This month features UV Light Detection, a technology that gives NASA's Solar Dynamics Observatory (SDO) more accurate measurements of the Sun's radiation and is used to measure individual's daily sun intake.



X-class flare which appeared March 29, 2014. Photo Credit: NASA GSFC Flickr

The Technology

UV Light Detection

Gaining insight into the workings of the Sun is no easy task. Science has come a long way since Galileo discovered sun spots with the naked eye, but still more research needs to be done to further understand how the Sun affects Earth.

NASA's Solar Dynamics Observatory is undertaking this mission. The SDO measures extreme ultraviolet (UV) radiation from the sun, which plays a key role in atmospheric heating and satellite drag. Without factoring for these measurements, this type of radiation can send spacecraft's plummeting back towards Earth. Goddard scientist Shahid Aslam saw shortcomings in how UV light was measured — particularly, how interference from other light sources affects the data being collected. His innovation isolated and measured just UV light and nothing else. In addition to creating clearer images of the Sun, Aslam noticed his invention was measuring wavelengths between 280 and 400 nanometers, the wavelengths which pass through Earth's atmosphere and affect human skin.

More Information

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The Partnership

UVA+B SunFriend

After Shahid Aslam realized he created a way to isolate and measure the Sun's UV rays that affect skin, he teamed up with marketer Karin Edgett to bring the NASA technology to the marketplace. The product, UVA+B SunFriend, measures both UVA and UVB rays. these ray are important for health purposes, as they pass through the atmosphere and make contact with Earth's surface.

The UVA+B SunFriend. Image Credit: Sensor Sensor LLC

UVA rays have longer wavelengths, between 400 and 320 nanometers, and penetrate deeper into the skin causing physical signs of aging. UVB's shorter wavelengths, between 320 and 280 nanometers, are responsible for producing vitamin D in the human body, but these light rays also cause sun burns. Managing one's sun exposure is a balance between getting enough UVB rays to produce vitamin D and getting too much of UVA or UVB, which can cause long term health problems or sun burn.

There is existing work aimed to help people control their sun exposure, the UV index shows the duration at which UV wavelengths will cause reddening of the skin. Shahid Aslam's creation is a more active approach to preventing sun related health issues while still getting a sufficient amount. The wearable wrist accessory allows users to set their personal skin color and sensitivity and reads UV exposure throughout the day. When the LED lights start to flash, the wearer has had the optimal amount of sun exposure for the day.

Why Measure UVA and UVB Light?

- There are regions in the world where vitamin D deficiency is considered a pandemic
- One in five people will get skin cancer in her or his lifetime
- There is a fine line between too much and too little sun, making a quantified approach beneficial
- Certain medications can increase sun sensitivity, so measuring UVA and UVB rays is a useful medical metric

The Innovator

Shahid Aslam

Aslam received his postgraduate education from both the University of London and the University of Oxford, the latter is where he received his doctorate in planetary physics. Currently Aslam is employed in NASA Goddard's Code 693 Planetary Systems Laboratory as the Principal Investigator of ICEE-TIMER mission. Other positions he's held at Goddard include instrument scientist, co-investigator of MiniFTS for SmallSat applications and space scientist.

Awards

- 2006 NASA Patent 7341932
- 2005 NASA Public Service Award Medal
- 2003 NASA Contractor Excellence Award