

CHALLENGE SPECS

CHALLENGE

Data-Driven Forecasting
of Solar Events

DISCIPLINES

Aerospace & Defense, Data,
Government

CHALLENGE AWARD

\$30,000

SOLVERS ENGAGED

579

SOLUTIONS

11

PROGRAM DURATION

165 days

GLOBAL SOLVER
PARTICIPATION

Solar flares have destructive effects on infrastructure on Earth, and also put astronauts at risk when in space. For many years, physicists have been trying to understand solar flares and their effect on the Earth. A major barrier to progress has been the lack of easily available data. Researchers at NASA challenged InnoCentive’s solvers to build a predictive algorithm that would accurately model solar particle behavior.

Challenge

- “Solar particle events” are dangerous to astronauts, who have to take cover in specially-protected areas of space stations when they occur; for this reason, they can also seriously hamper missions.
- Despite a lot of work, until now there has been no available method to predict the onset, intensity or duration of such events.
- The challenge was to build a predictive algorithm to say with confidence when astronauts have the “all-clear” as well as, the ability to predict solar flares with plenty of lead time.

Solutions

- In response to this challenge, project rooms were opened in over 50 different countries.
- The \$20,000 award was given to Bruce Cragin, a retired radio frequency engineer from New Hampshire, for his proposed use of ground-based data to predict solar events.
- His solution dramatically improved accuracy and time-window of predictions, giving a prediction capability of up to 8 hours with 85% accuracy, and a 3-sigma confidence interval.

Result

- The solution has been tested, and teams are now working to leverage the results, building them into current NASA programs.
- The solution also provided a fresh perspective and new avenues of discovery to the solar physics community.
- Since 95% of solvers had never worked on a NASA project before, the agency was able to fulfill its public charter of engaging people through the challenge.