

York Astronomer, Local High School Student Find a New Old Star

Emery Collegiate student (and now graduate) Akshay Awal and York Science & Engineering professor Patrick Hall have made a rare discovery, identifying a white dwarf star only 100 light years away from Earth.

Professor Hall and Mr. Awal collaborated as part of the annual York-Seneca Summer Science & Technology Program (YSSSTP) which just ended its 17th successful season. YSSSTP evolved out of a 1992 project to bring students of Westview Centennial Secondary School onto the York University campus. By 2002, it had expanded to involve Seneca College's Seneca@York campus, five local area high schools, and two school boards. Through YSSSTP students come together for an intensive Co-operative Education experience. Faculty in either a science or a computing facility at York or Seneca mentor students, and share time, talent and expertise. In addition to knowledge and new skills, students also learn about the world of work through a series of "in-class" sessions leading to the completion of a Co-operative Education Credit.

For several weeks Mr. Awal's task as Professor Hall's mentee was to study data collected from the Sloan Digital Sky Survey. a 120MP digital camera designed to photograph one-quarter of the night sky. Special software recorded and classified objects in each photo. Those which could not be identified automatically using the specialized software were labeled as UNKNOWN. This is where the input of trained students is important. Students do what the software cannot - help to interpret what these UNKNOWN objects in fact are.

One day, Mr. Awal was surprised when one of the UNKNOWN objects he was analyzing displayed some very unique characteristics; he quickly brought it to the attention of Professor Hall. Upon further study, Professor Hall and several collaborators determined that this UNKNOWN object is in fact an orange-hot white dwarf only 100 light years from Earth. That's so close that it can be seen to zip across the sky in photographs taken over the last 50 years (see animation).

The object is estimated to have been a white dwarf --- the burnt-out remnant of a star like our Sun --- for nearly nine billion, years, twice as long as our Sun has existed. In fact, the white dwarf's parent star likely was born and died before our galaxy's spiral disk was fully formed.

Why did it take so long to discover a star so close to Earth? Because astronomers did not have the benefit of new technology which has enabled them to see the sky as never before. This white dwarf is nearly one-million times fainter than the faintest star visible to the naked eye in the night sky.

The research was published in the July 2008 issue of The Astronomical Journal.

Animation Caption: (<http://ara.phys.yorku.ca/timelapse.gif>)

Time-lapse image of the sky around the newly discovered white dwarf.

Image credit Patrick Hall (York University), the Association of Universities for Research in Astronomy, and the Sloan Digital Sky Survey (sdss.org).

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Media contact:

Sean Billingsley, Communications Manager, York University, 416 736 2100 x22814 / sbilling@yorku.ca