

## H. Wade Patterson Award Winners

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The H. Wade Patterson Award was established in 2004 in memory of its namesake, who from the late 1940s began work at laboratories that used accelerators as part of their research activities. Wade was also instrumental along with about a dozen other scientists in forming the Accelerator Section of the Health Physics Society (HPS).

Wade went to Berkeley, California, after his discharge from the army in 1945, and his first job was in construction, as he had already missed the application deadline for entering the university. He worked near the 184-inch cyclotron. In the book “A History of Accelerator Protection,” edited by H. Wade Patterson and Ralph H. Thomas (1994), Wade recalls that his first classified job was to burn solid maple patterns (since maple could be honed to exact tolerances) used to form the irregular sheet metal surfaces that were used in the Calutron, the magnetic isotope separator for isotope separation. The precise shape of these devices were considered secret, which if known could have given away the separation process used in the Manhattan Project.

At the end of the school year, Wade received his first health physics job which involved personnel dosimetry, known then as the film badge program. He would compare the blackening of an employee film badge with a standard film. The human eye can distinguish 200,000 shades of gray, so it was fairly accurate. He made his own standard films by exposing them all simultaneously to National Institute of Standards and Technology (NIST) calibrated radium sources at varying distances using the inverse square law. By making his own holder and jig and exposing for precisely one minute, Wade was able to create a set of standard films, logarithmically spaced to measure exposures from 0.01 to 1 roentgens. Wade further refined these films by exposing films to known x-ray spectra including  $^{32}\text{P}$ ,  $^{90}\text{Sr}$ , and uranium. He used jigs to hold the badges in a manner in which they would likely be exposed during work at the laboratory – having these one-of-a-kind devices fabricated in the machine shops. Wade also used badges for environmental monitoring and to compare weekly operational changes in the machine. The 60-inch cyclotron, which ran 24 hours per day bombarding deuterons into various targets, had the highest radiation.

Wade continued to work at the “Rad Lab” part-time and in the summers while he continued his schooling. Wade also was involved in monitoring and later in shielding of large accelerators. When the 184-inch cyclotron came on line, Wade was there recording radiation levels far in excess of what had seemed acceptable. To determine the worst-case scenario, Wade used a Juno and recorded the forward neutron beam, 10 feet below the center. He observed that when he reversed his stance, the radiation measured increased. Quickly realizing that this increase was from protons being knocked out of his body and forming ionization tracks, he had in effect measured the dose a person would receive if accidentally exposed. It took many months to

adequately shield the cyclotron. Wade continued to make valuable measurements, calculations, and shielding experiments working under the capable mentorship of Burton Moyers.

Wade eventually rose to be head of the Health Physics Group, publishing many papers in *Radiation Research*, *Nucleonics*, and *Health Physics*. Some of the noteworthy achievements of this group by 1965 included the use of plastic scintillators to measure fast neutron flux, the use of gold or indium foils or cadmium-moderated tantalum discs to integrate fast neutrons, paraffin-moderated silver foils around a Geiger counter for integrating pulsed neutron fluxes, and polyethylene-lined proportional counters which read in  $\text{MeV}/\text{cm}^2$ . This response could then be divided by that of a moderated boron trifluoride ( $\text{BF}_3$ ) counter whose response is in  $\text{neutrons}/\text{cm}^2$  to get an average neutron energy in  $\text{MeV}/\text{neutron}$ .



This year the Accelerator Section was pleased to announce two honorees for the H. Wade Patterson Award. The winner of the H. Wade Patterson Award for the best accelerator-related paper went to Bryan Bednarz (left) for his paper on Monte Carlo-based calculations of neutron activation in a medical linear accelerator. Bryan is from Rensselaer Polytechnic Institute in Troy, New York. Bryan's work focused on the determination of the activation potential from medical linear accelerators as sources

of occupational exposure and un-intended patient exposure. We congratulate Bryan on a job well done. Bryan received a plaque and \$300 honorarium for his efforts.

The accelerator section would also like to congratulate Maxwell Ankrah (right) upon receiving an honorable mention for his work on "Active, Non-Intrusive Inspection Technologies for Homeland Defense." Maxwell plans to use accelerator-based imaging technologies to interrogate shipping containers Maxwell is a student at Idaho State University in Pocatello, Idaho. Maxwell received a certificate of merit.



Both students were fortunate to spend a little time with Dr. Ralph Thomas (at center in photo at left), who had known Wade personally for many years and who took the time to share a few anecdotes about the man in whose memory this award was created. Each of these students was also recognized at the HPS banquet by Past President Ruth McBurney during the society awards. This is the first time that this award has been recognized at the society level and

we are grateful to the HPS Board of Directors for their gracious acceptance of our request for societal recognition. Wade is generally considered to be the first, or among the first of the accelerator health physicists and was one of the original founders of the section.

Ralph Thomas also generously contributed his books for auction toward a scholarship for a student to attend the professional development school on accelerators at the upcoming midyear. The auction was run by our very own newsletter editor, Linnea Wahl (below), in our midyear booth at the Portland HPS meeting. Thanks to all the folks from the Northern California Chapter as well those members of the Accelerator Section who helped to man the booth and distribute important information. Many meetings were held during the Portland meeting to finalize details for the upcoming midyear in Oakland. It should be a terrific meeting and I urge you all not to miss it.

