Nobel winner Penrose has long-standing ties to Penn State

Mathematician is member of University's Institute for Gravitation & the Cosmos and serves on its Scientific Advisory Board.

The announcement of this year's Nobel Prize in Physics carries extra meaning for some in Penn State's Eberly College of Science. Sir Roger Penrose, one of three newly crowned laureates, has long-standing ties to the college.

Penrose, who was awarded half of the Nobel for proving that black holes must in fact exist if Einstein's seminal Theory of General Relativity is correct, is the emeritus Rouse Ball professor of mathematics at Oxford University in England. From 1993 until 2012, he was also the Francis R. and Helen M. Pentz visiting professor of Physics and Mathematics at Penn State, and he remains a visiting research faculty and member of the advisory board of Penn State's Institute for Gravitation & the Cosmos.

Penrose's Penn State connection began soon after Abhay Ashtekar, now Evan Pugh Professor of Physics at Penn State and director of the Institute for Gravitation & the Cosmos, arrived in University Park. Himself a leading black hole theorist, Ashtekar had done a postdoctoral fellowship with Penrose at Oxford, and prevailed on his former mentor to visit. For a number of years thereafter, as Pentz chair, Penrose was in residence at University Park for six to eight weeks each semester.

"He has given innumerable seminars to us, discussions late into the night," Ashtekar remembered. "It has been really wonderful for all of us, from students to the most senior faculty. Students just loved his talks, in part because of his intellectual breadth." In addition to his work on gravitational theory, Penrose is reknowned for the discovery of non-repeating tiles, a major advance in abstract mathematics, and for his popular books on the nature of consciousness.

Nitin Samarth, George A. and Margaret M. Downsbrough Department Head in Physics, also remembered Penrose's time in residence at Penn State.

"In addition to the enormous impact on the intellectual life of our department, Sir Roger's visiting professorship created a memorable experience for our undergraduate students," Samarth said. "I recall that during his first visits, Sir Roger resided in a faculty suite in Atherton Hall and interacted daily with the resident honors students. I can only imagine the impact of the stimulating conversations that ensued!"

On one memorable occasion, in 2009, Penrose returned to University Park to deliver a public lecture at a conference on classical and quantum gravity in honor of Ashtekar's 60^{th} birthday. (The lecture can be viewed here: https://news.psu.edu/story/176279/2009/05/28/penrose-fashion-faith-and-fantasy-how-big-infinity-june-4.)

Explaining Penrose's Nobel-winning contribution, Ashtekar noted that although black holes are predicted by General Relativity, "For the longest time people didn't understand their

mathematical structure and were very skeptical that they existed in nature. Einstein himself was skeptical."

Penrose's discoveries, he said, made clear that if Einstein was right, the formation of black holes in nature was inevitable: "There was no way out." Winning the Nobel, he added, needed only the confirming observations of a supermassive black hole at the center of our galaxy by fellow physicists Reinhard Genzel and Andrea Ghez, who shared this year's prize.

"Today Penn State is extremely proud of Roger Penrose, especially in light of his long-standing ties to our Institute for Gravitation & the Cosmos, where he has been invaluable to our efforts pushing the boundaries of physics," said Tracy Langkilde, Verne M. Willaman Dean of the Eberly College of Science.

"The announcement of Sir Roger's Nobel Prize is a well-deserved credit to his lifetime of scientific discovery and scholarship."