

What's a 'rich club'? Concept originated in informatics and social networking study at IU: www.heraldtimesonline.com

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Indiana University brain science professor Olaf Sporns is quick to throw some credit for his pioneering research across campus to work published by colleagues in the School of Informatics.

"When we use the term, 'rich clubs,' that's actually a term thrust into use by other researchers at IU five years ago," he said recently. "They did the first paper on rich-club organization, only they looked at social networks and protein networks and other things. We have now applied some of the methods they originally developed and applied it to brain-mapping.

"It's a neat little twist on this," he said. "I always like to tell people how great a university we have and how many innovations are coming from here. This is one of them."

The paper Sporns references was a collaboration among informatics professors Alessandro Vespignani and Alessandro Flammini and post-doctoral candidates Vittoria Colizza and M. Angeles Serrano (both now professors teaching in Europe). "We were working on complex networks, mostly interested in the Internet at the time," said Vespignani. "We were looking at how computers and how the Internet and service providers were connected to each other. At the same time we were looking at other infrastructures like airport networks and things like that.

"One thing was to look at the different varieties of nodes," he went on. "If you're meeting about the social sciences if you have a lot of friends and acquaintances with other people, a lot of connections, we called that a rich network."

Vespignani also said the term functions literally. Rich people tend to run in the same social networks. "Influential people tend to be connected together," he said.

The IU informatics researcher acknowledged that the term has entered the academic lexicon if not beyond.

"It is an accepted term for this phenomenon, a measure of network science, in which you measure the number of nodes, the number of connections, the degree of distribution. Our paper was the first to provide a real way to measure this effect. We were going beyond the metaphor and that was appealing to people, I think," he said.

"I'm glad that Olaf found the theory can apply in a system that is a biological system," Vespignani said. "In one of our analogies one of the things we did find was that if you look at the protein information network, the biochemical network that supervises the function of cell proteins, they interact with each other but not among themselves. It's interesting now that this new work does find rich networking within a biological context which is both fascinating and somewhat gratifying."

The researcher credited Mike Dunn, the first dean of informatics, for creating a culture that enabled interdisciplinary work that in this context began nearly a decade ago.

"It's a really interesting success story for Indiana University," he said. "It's a really good feeling to drop a seed of knowledge and concepts and you see a few years later another guy hanging around with us like Olaf who is able to transport these ideas in a completely different area. I think his work will have a huge impact. It's a great feeling."