# The secret life of scientific ideas

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Many of the most memorable stories in the history of science revolve around the conscious realization of an idea - the "Eureka!" moment. But what triggers these moments? Is there always some serendipitous event preceding a sudden epiphany, such as when Isaac Newton famously figured out gravity when he saw a falling apple?

Writing in September's *Physics World*, Vitor Cardoso talks about how these questions led him on a quest of discovery through the web-based project The Birth of an Idea, which he co-founded with artist Ana Souse Carvalho.

"Ana and I had been talking about the similarities between creativity in art and science," writes Cardoso. "We hit upon the idea of creating a repository of essays written by scientists describing the genesis of their ideas." To date, they have had 64 essays in total, by contributors from around the world and from a wide range of research fields.

As a physicist himself, Cardoso didn't just want the tales of breakthrough discoveries, but also stories of the trivial and the ordinary, the small victories and the long struggles. "As a physicist, I am well aware that this is the territory where most of us toil," he writes.

Not all idea-generation is as exotic or glamorous as you might think. "We hear from colleagues that they have their best ideas walking home or in bed or in the shower," says Cordoso, "and we can't help but nod in agreement while reading Masaru Shibata when he tells us, with the concision of a haiku: 'In my experience, ideas often come to me when I

am taking a bath. Thus, I recommend taking a bath every day.' "

But figuring out a tough physics problem isn't always as easy as taking a bath. In the article, Cardoso relays the respondents' stories of frustration and agitation at dealing with problems. He also reveals how most of them do not fit the "lone genius" stereotype but instead say that working in groups and talking to other colleagues is truly the source of most ideas - a kind of "spontaneous brainstorming".

"The image of the lonely genius with her or his 'Aha!' moment is an illusion," wrote one contributor to the project, Nicolas Yunes. "The birth of an idea is much more of a community activity than we sometimes care to acknowledge."

Vitor Cardoso is a theoretical physicist working on black-hole physics at the University of Lisbon in Portugal and a visiting fellow at the Perimeter Institute for Theoretical Physics in Waterloo, Canada.

The article includes two short essays by physics researcher Pedro Figueira at the Centro de Astrofísica da Universidade do Porto, Portugal, and professor of physics Djordje Minic at Virginia Tech, US, about how their ideas emerge.

**More information:** physicsworld.com/cws/article/i … -of-scientific-ideas

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