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The features marked with a star (*) are based entirely on material taken straight from standard research (and other Official and Therefore Always Correct) literature. Many of the other articles are genuine, too, but we don't know which ones.

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Where There's More

There's always new improbable — it's not what you expect! — stuff on the **Improbable Research blog** at [IMPROBABLE.COM](https://www.improbable.com)

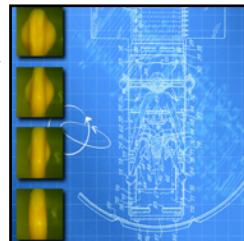
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On the Front Cover

On the right: Technical drawing from U.S. Patent #3,216,423, issued to George and Charlotte Blonsky for their device to aid women in giving birth — the woman is strapped onto a circular table, and the table is then rotated at high speed. The Blonskys were posthumously awarded an Ig Nobel Prize for it, in 1999.

On the left: Spinning egg yolks (see page 13).



On the Back Cover

Observers on a street in New York City, 2021. Photo by A.S. Kaswell.



Some Coming Events

The Covid-19 pandemic has introduced excitingly boundless uncertainty as to whether, when, and where public activities will happen in the near future. In 2022 some will happen teledistantly.

(See [IMPROBABLE.COM](https://www.improbable.com) for details of these and other events.)

June 25-September 11, 2022

— Ig Nobel Prizes exhibition, Taipei, Taiwan

September 1, 2022

— Chicon, Chicago, Illinois, USA

September 13, 2022

— MIT, Cambridge, Massachusetts, USA

September 15, 2022

— THE 32ND FIRST ANNUAL IG NOBEL PRIZE CEREMONY (WEBCAST)

October 12 - November 13, 2022

— Ig Nobel Prizes exhibition, Osaka, Japan

October 12, 2022

— Café Scientifique, Muret, France



ROTATION OF WHIRLING DERVISHES

Research about a moving form of meditation and dance

by Breckenridge Ahlo, Improbable Research staff

Physics of the Skirts of Whirling Dervishes

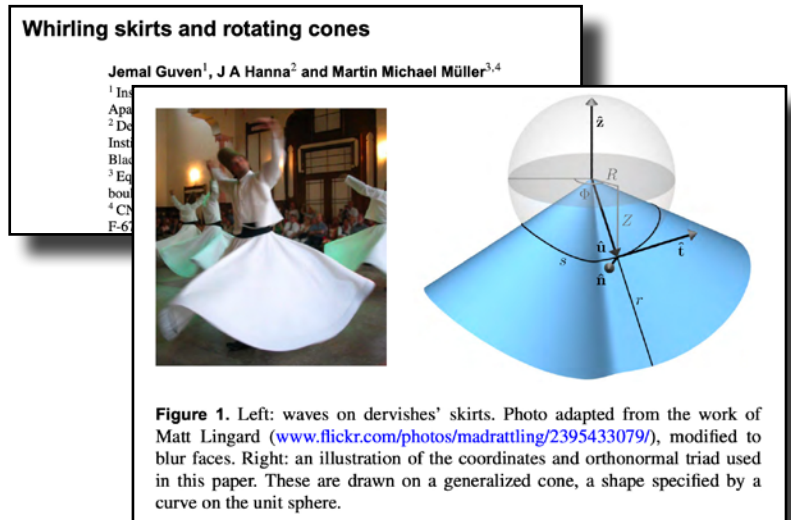
"Whirling Skirts and Rotating Cones," Jemal Guven, J.A. Hanna, and Martin Michael Müller, *New Journal of Physics*, vol. 15, no. 113055, 2013. The authors, at Universidad Nacional Autónoma de México; Virginia Polytechnic Institute and State University, USA; Université de Lorraine, Metz, France; and CNRS, Institut Charles Sadron, Strasbourg, France, report:

Steady, dihedrally symmetric patterns with sharp peaks may be observed on a spinning skirt, lagging behind the material flow of the fabric. These qualitative features are captured with a minimal model of traveling waves on an inextensible, flexible, generalized-conical sheet rotating about a fixed axis. Conservation laws are used to reduce the dynamics to a quadrature describing a particle in a three-parameter family of potentials. One parameter is associated with the stress in the sheet, another is the Noether current associated with rotational invariance and the third is a Rossby number which indicates the relative strength of Coriolis forces. Solutions are quantized by enforcing a topology appropriate to a skirt and a particular choice of dihedral symmetry. A perturbative analysis of nearly axisymmetric cones shows that Coriolis effects are essential in establishing skirt-like solutions.

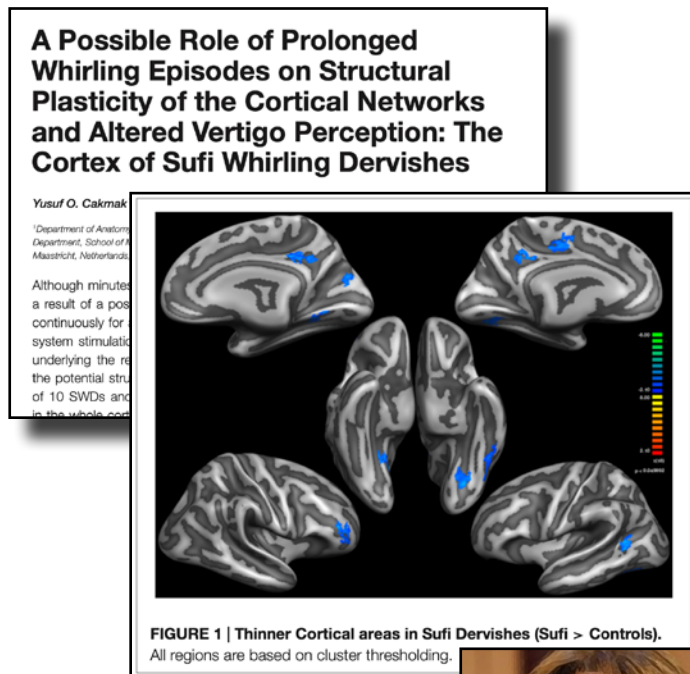
Whirling Dervish in an MRI Tube

"A Possible Role of Prolonged Whirling Episodes on Structural Plasticity of the Cortical Networks and Altered Vertigo Perception: The Cortex of Sufi Whirling Dervishes," Yusuf O. Cakmak, Gazanfer Ekinçi, Armin Heinecke, and Safiye Cavdar, *Human Frontiers in Neuroscience*, vol. 11, no. 3, January 3, 2016. The authors, at Otago University, New Zealand; Marmara University, Turkey; Maastricht University, Netherlands; and Koç University, Turkey, report:

Although minutes of a spinning episode may induce vertigo in the healthy human, as a result of a possible perceptual plasticity, Sufi Whirling Dervishes (SWDs) can spin continuously for an hour without a vertigo perception. This unique long-term vestibular system stimulation presents a potential human model to clarify the cortical networks underlying the resistance against vertigo. This study, therefore, aimed to investigate the potential structural cortical plasticity in SWDs. MRI of 10 SWDs and 10 controls were obtained, using a 3T scanner.



Detail from the study "Whirling Skirts and Rotating Cones."



Detail from the study. "A Possible Role of Prolonged Whirling Episodes on Structural Plasticity of the Cortical Networks and Altered Vertigo Perception: The Cortex of Sufi Whirling Dervishes."



Safiye Cavdar, co-author of the study "A Possible Role of Prolonged Whirling Episodes on Structural Plasticity of the Cortical Networks and Altered Vertigo Perception: The Cortex of Sufi Whirling Dervishes."
Drawing by Nan Swift.