

Goddard Tech 12

Each month the Strategic Partnerships Office will tell the story of a renowned innovator at NASA's Goddard Space Flight Center and show how their technological breakthroughs are brought from the labs to our lives. This month features gear bearings, developed by John Vranish to increase resolution for telescopes, and the licensing of this technology to Bahari Energy.



The Technology Gear Bearings

Gear bearing technology is a mechanical engineering innovation that, true to its name, combines the function of gears and bearings into one unit that improves gear drive for electrical, internal combustion, and turbine motors. This single unit reduces the weight, number of parts, size, and cost, while also increasing load capacity and performance.

Existing gear systems have drawbacks, including weak structures, large size, poor reliability, and high costs. Gear bearings have solved these problems with their simpler construction, fewer parts, and superior strength.



Image Credit: NASA GSFC

Applicable Industries and Contribution to U.S. GDP



More Information NASA Headquarters Washington, D.C. www.nasa.gov

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The Licensing Bahari Energy

Bahari Energy is focused on cost effective and sustainable solutions to increasing worldwide energy demands.

Bahari seeks to harness wind energy from urban areas and turn it into electricity. Densely populated areas aren't yet a viable source for wind energy because of inconsistent wind direction, large blade requirements, and low kilowatt production. Bahari's proposed solution, the Wind Tower, captures wind from any direction then shoots the wind into the structure's base, where a drum turbine is spinning to turn that wind into electricity.



Photo Credit: Bahari Energy

Environmentally friendly with internally hidden blades



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Compact size ideal for urban areas

Cut in rate of 3 mph, half the average turbine cut in rate



Ten times or greater energy output compared to market turbines

To improve the Wind Tower's performance, Bahari licensed NASA Goddard's gear bearing technology. Gear bearing technology will improve the performance of the structure's drum turbine while also lowering the relative costs associated with production.

Habib Bahari, founder and CEO of Bahari Energy, estimates an electrical output increase of 40% by using gear bearings. This licensing agreement between NASA and Bahari will help make capturing urban winds a scalable solution for increasing energy demands.

The Innovator John Vranish

After earning a B.S. from West Point in 1962 and an M.S. in electrical engineering from George Washington University in 1973, Vranish led a career as an engineer in the robotics and space industries. During his 20 years as an innovator for NASA,



he developed the gear bearings and many other technologies. In 2006 Vranish started his own company, Vranish Innovation Technologies LLC, and is the acting president. The awards below are a testament to how innovative his career at NASA was.



Nominee for 2019 National Inventor's Hall of Fame, NASA/Goddard Space Flight Center



Inventor of the Year, Goddard Space Flight Center (2004-2005, 1992-1996)



Outstanding Service as Mentor, NASA Robotics Academy Program



NASA Administrator Daniel Golden Award, Goddard Space Flight Center (2004-Present)