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NASA's Goddard Space Flight Center
Science & Technology

An Ancient Black Hole Collision Reverberates

Columbia astronomers recently detected a faraway event that challenges existing theories about black-hole formation.

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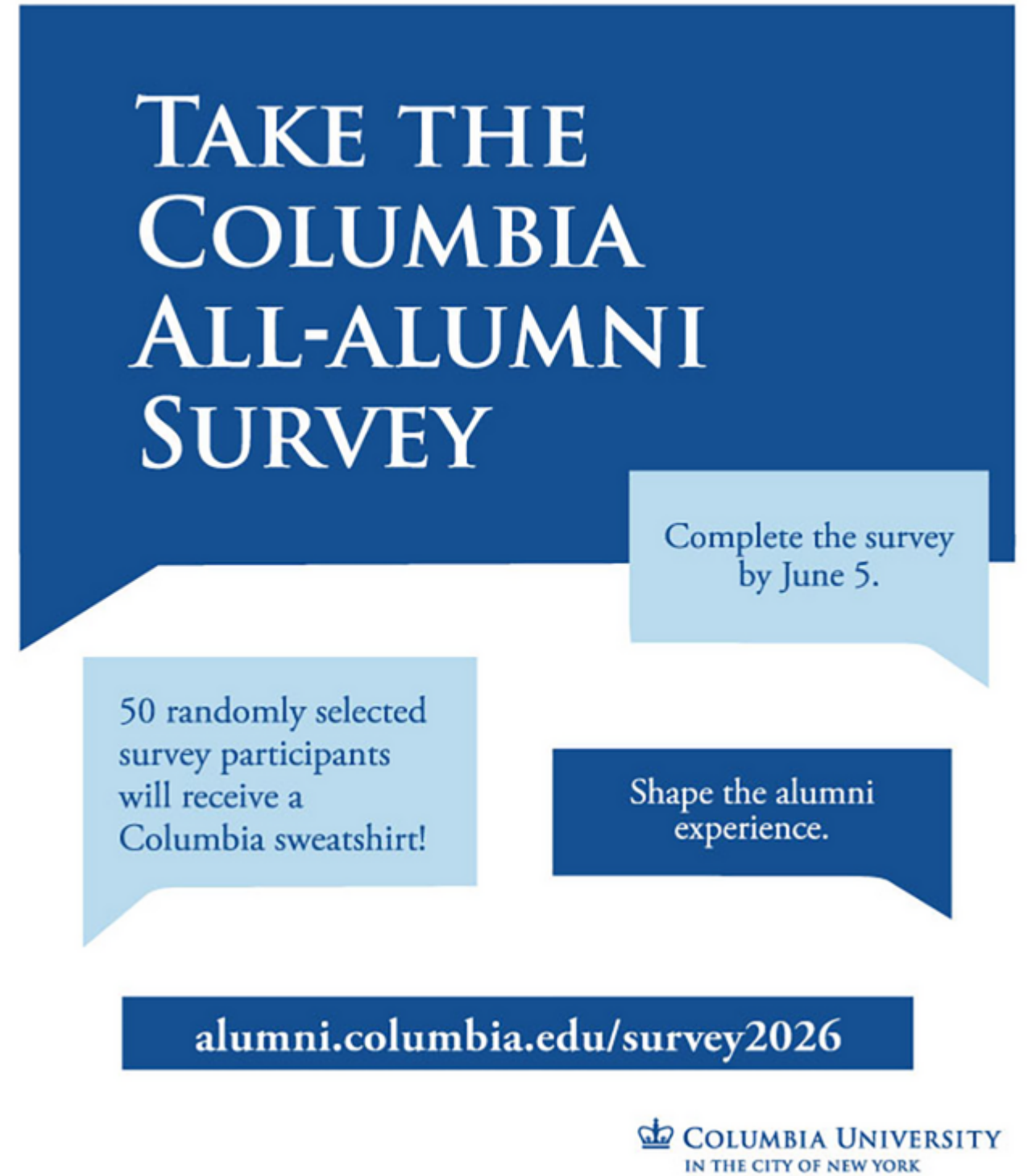
Like two spinning tops in a salad bowl, the pair of black holes drifted closer and closer together, began to orbit one another at dizzying speeds, and then, in a moment of unimaginable violence and beauty, merged — causing disturbances in the fabric of space-time that rippled through the universe.

The echoes of that ancient collision — which occurred billions of light-years away — were recently detected by an international team of scientists that includes Columbia astronomer Maximiliano Isi and PhD student Harrison Siegel. The scientists' observations have raised profound questions, in part because the black holes that merged were each so massive that their existence challenges prevailing theories about how such objects form in the first place.

"To me, this discovery highlights that gravitational-wave astronomy is a field that is full of surprises, interesting puzzles, and open questions," Isi says. "We are at the frontier of the unknown."

This article appears in the Fall 2025 print edition of Columbia Magazine *with the title* "*Last Dance.*"

Guide to school abbreviations



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