

## PrimeGrid's Generalized Cullen/Woodall Prime Search

On 16 April 2025, 11:37:45 UTC, PrimeGrid's Generalized Cullen/Woodall Prime Search found the largest known Generalized Cullen Prime:

$$4052186 \cdot 69^{4052186} + 1$$

The prime is 7,451,366 digits long and will enter "The Largest Known Primes Database" (<https://t5k.org/primes>) ranked 16<sup>th</sup> overall. This is the second largest prime ever found by PrimeGrid.

The discovery was made by Mark Williams of the United States using 8 cores of an AMD EPYC 9554 64-Core Processor with 196GB RAM, running Microsoft Windows 10 Professional x64 Edition. This computer took about 10 hours, 15 minutes to complete the probable prime (PRP) test using PRST. Mark is a member of TeAm AnandTech.

The PRP was confirmed prime on 17 April 2025 by an AMD Ryzen 9 7950X3D @ 4.20GHz with 128GB RAM, running Debian 12.5. This computer, using 8 cores, took 12 hours and 32 minutes to complete the primality test using PRST.

Credits for the discovery are as follows:

1. Mark Williams (United States), discoverer
2. PrimeGrid, et al.
3. MultiSieve, sieve program developed by Mark Rodenkirch
4. gcwsieve, sieve program developed by Geoff Reynolds
5. PRST, primality program developed by Pavel Atnashev

Entry in "The Largest Known Primes Database" can be found here:  
<https://t5k.org/primes/page.php?id=140607>

Using a single PC would have taken years to find this prime. This timely discovery would not have been possible without the thousands of volunteers who contributed their spare CPU cycles. A special thanks to everyone who contributed their advice and/or computing power to the search -- especially to all the sievers who worked behind the scenes to make a find like this possible.

PrimeGrid's Generalized Cullen/Woodall Prime Search will continue seeking primes for other primeless bases. To join the search please visit PrimeGrid:  
<https://www.primegrid.com>

# **PrimeGrid's Generalized Cullen/Woodall Prime Search**

## **About PrimeGrid**

PrimeGrid is a distributed computing project, developed by Rytis Slatkevičius and currently managed by Tyler Bredl, Scott Brown, Michael Goetz, Darren Li, Dao Heng Liu, Reginald McLean, Rytis Slatkevičius, Roman Trunov, and Christian Wallbaum.

PrimeGrid utilizes BOINC to search for primes with the primary goal of bringing the excitement of prime finding to the "everyday" computer user. Simply download the software and let your computer do the rest. Participants can choose from a variety of prime forms to search. With a little patience, you may find a large or even record-breaking prime.

## **BOINC**

The Berkeley Open Infrastructure for Network Computing (BOINC) is a software platform for distributed computing using volunteered computer resources. It allows users to participate in multiple distributed computing projects through a single program. Currently BOINC is being developed by a team based at the University of California, Berkeley led by David Anderson.

This platform currently supports projects from biology to math to astronomy. For more information, please visit BOINC: <https://boinc.berkeley.edu>

For more information about PrimeGrid and a complete list of available prime search projects, please visit: <https://www.primegrid.com>