PrimeGrid's
AP27 Search

On 26 May 2023, 01:04:36 UTC, PrimeGrid's AP27 Search (Arithmetic Progression of 27 primes) found a progression of 27 primes:

$$277699295941594831+170826477*23\#*n \text{ for } n=0..26$$

This is the second known AP27.

The discovery was made by Tom Greer of the United States using an NVIDIA GeForce RTX 4080 on an AMD Ryzen 9 7950X CPU @ 4.50GHz running Microsoft Windows 10 Professional x64 Edition. This computer took about 4 minutes and 22 seconds to process the task (each task tests 100 progression differences of 10 shifts each). Tom Greer is a member of the Antarctic Crunchers team.

The progression was verified on 26 May 2023, 01:04:39 UTC, by Vasil Zakiev of Russia using an NVIDIA GeForce RTX 4090 on an AMD Ryzen 9 7950X CPU @ 4.50GHz running Microsoft Windows 11 Professional x64 Edition. This computer took about 1 minute and 27 seconds to process the task. Vasil Zakiev is a member of the Crystal Dream team.

The AP27 will be listed in Jens Kruse Andersen's "Primes in Arithmetic Progression Records" page (http://primerecords.dk/aprecords.htm) under the section(s):

- All known AP24 to AP27 (http://primerecords.dk/aprecords.htm#ap24)

Credits for the discovery are as follows:

1. Tom Greer (United States), discoverer
2. PrimeGrid, et al.
3. AP26, a primality program originally developed by Jaroslaw Wroblewski, adapted to BOINC by Geoff Reynolds, written for GPUs by Bryan Little and Gerrit Slomma, and with maintenance and improvements by Bryan Little and Iain Bethune.

Using a single PC would have taken decades to find this progression, so this timely discovery would not have been possible without the thousands of volunteers who contributed their spare CPU (and GPU) cycles. A special thanks to everyone who contributed their advice and/or computing power to the search.

Additional AP Information

How to search for 26 primes in arithmetic progression? by Jaroslaw Wroblewski
　　　https://www.math.uni.wroc.pl/~jwr/AP26/AP26v3.pdf
Primes in arithmetic progression - Wikipedia
　　　https://en.wikipedia.org/wiki/Primes_in_arithmetic_progression
Prime Arithmetic Progression - Wolfram MathWorld
　　　https://mathworld.wolfram.com/PrimeArithmeticProgression.html
Arithmetic sequence - The Prime Glossary at the Prime Pages
　　　https://t5k.org/glossary/page.php?sort=ArithmeticSequence

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The 27 terms of the AP27:

277699295941594831+170826477*23#*n for n=0..26

23#=2*3*5*7*11*13*17*19*23=223092870

277699295941594831+170826477*223092870*0=277699295941594831
277699295941594831+170826477*223092870*1=315809464967513821
277699295941594831+170826477*223092870*2=353919633993432811
277699295941594831+170826477*223092870*3=392029803019351801
277699295941594831+170826477*223092870*4=430139972045270791
277699295941594831+170826477*223092870*5=468250141071189781
277699295941594831+170826477*223092870*6=506360310097108771
277699295941594831+170826477*223092870*7=544470479123027761
277699295941594831+170826477*223092870*8=582580648148946751
277699295941594831+170826477*223092870*9=620690817174865741
277699295941594831+170826477*223092870*10=658800986200784731
277699295941594831+170826477*223092870*11=696911155226703721
277699295941594831+170826477*223092870*12=735021324252622711
277699295941594831+170826477*223092870*13=773131493278541701
277699295941594831+170826477*223092870*14=811241662304460691
277699295941594831+170826477*223092870*15=849351831330379681
277699295941594831+170826477*223092870*16=887462000356298671
277699295941594831+170826477*223092870*17=925572169382217661
277699295941594831+170826477*223092870*18=963682338408136651
277699295941594831+170826477*223092870*19=1001792507434055641
277699295941594831+170826477*223092870*20=1039902676459974631
277699295941594831+170826477*223092870*21=1078012845485893621
277699295941594831+170826477*223092870*22=1116123014511812611
277699295941594831+170826477*223092870*23=1154233183537731601
277699295941594831+170826477*223092870*24=1192343352563650591
277699295941594831+170826477*223092870*25=1230453521589569581
277699295941594831+170826477*223092870*26=1268563690615488571

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About PrimeGrid

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

PrimeGrid utilizes BOINC and PRPNet 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/

PRPNet
PRPNet is a client/server application written by Mark Rodenkirch that is specifically designed to help find prime numbers of various forms. It is easily ported between various OS/hardware combinations. PRPNet does not run each PRP test itself, but relies on helper programs, such as LLR, PFGW, phrot, wwww, and genefer to do the work.

For more information, please visit PrimeGrid's PRPNet forum thread:
https://www.primegrid.com/forum_thread.php?id=1215

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