

PrimeGrid's AP27 Search

On 23 September 2019, 06:25:41 UTC, PrimeGrid's AP27 Search (Arithmetic Progression of 27 primes) found the first known progression of 27 primes:

$$224584605939537911+81292139*23\#*n \text{ for } n=0..26$$

This is the first AP27 discovered after PrimeGrid's search of more than three years. It's also the largest known AP24, AP25 and AP26 (smaller start but larger end than the old record).

The discovery was made by Rob Gahan of Ireland using a NVIDIA GTX 1660 Ti on an Intel(R) Core(TM) i5-9400 CPU @ 2.90GHz running Microsoft Windows 10 Professional x64 Edition. This computer took about 23 minutes to process the task (each task tests 100 progression differences of 10 shifts each). Rob is a member of the Storm team.

The progression was verified on 23 September 2019 21:31:31 UTC, by Hans Rensen of the Netherlands using an NVIDIA GeForce RTX 2070 GPU on an Intel(R) Core(TM) i7-6850K CPU @ 3.60GHz running Microsoft Windows 10 Professional x64 Edition. This computer took about 13 minutes to process the task. Hans is a member of the Dutch Power Cows 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. Rob Gahan (Ireland), 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
<http://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
<http://mathworld.wolfram.com/PrimeArithmeticProgression.html>

Arithmetic sequence - The Prime Glossary at the Prime Pages
<http://primes.utm.edu/glossary/page.php?sort=ArithmeticSequence>

The 27 terms of the AP27

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224584605939537911+81292139*23#*n for n=0..26

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

224584605939537911+81292139*223092870*0=224584605939537911
224584605939537911+81292139*223092870*1=242720302537486841
224584605939537911+81292139*223092870*2=260855999135435771
224584605939537911+81292139*223092870*3=278991695733384701
224584605939537911+81292139*223092870*4=297127392331333631
224584605939537911+81292139*223092870*5=315263088929282561
224584605939537911+81292139*223092870*6=333398785527231491
224584605939537911+81292139*223092870*7=351534482125180421
224584605939537911+81292139*223092870*8=369670178723129351
224584605939537911+81292139*223092870*9=387805875321078281
224584605939537911+81292139*223092870*10=405941571919027211
224584605939537911+81292139*223092870*11=424077268516976141
224584605939537911+81292139*223092870*12=442212965114925071
224584605939537911+81292139*223092870*13=460348661712874001
224584605939537911+81292139*223092870*14=478484358310822931
224584605939537911+81292139*223092870*15=496620054908771861
224584605939537911+81292139*223092870*16=514755751506720791
224584605939537911+81292139*223092870*17=532891448104669721
224584605939537911+81292139*223092870*18=551027144702618651
224584605939537911+81292139*223092870*19=569162841300567581
224584605939537911+81292139*223092870*20=587298537898516511
224584605939537911+81292139*223092870*21=605434234496465441
224584605939537911+81292139*223092870*22=623569931094414371
224584605939537911+81292139*223092870*23=641705627692363301
224584605939537911+81292139*223092870*24=659841324290312231
224584605939537911+81292139*223092870*25=677977020888261161
224584605939537911+81292139*223092870*26=696112717486210091

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About PrimeGrid

PrimeGrid is a distributed computing project, developed by Rytis Slatkevičius and currently managed by James Breslin, Scott Brown, Ulrich Fries, Michael Goetz, Roger Karpin, Rytis Slatkevičius, and Van Zimmerman.

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: <http://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, www, and genefer to do the work.

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

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