World Community Grid Newsletter

August 2025

In Memory of Dylan Bucci Challenge generates 600 CPU years of computation.

On February 19th, 2025, Sisler Cyber Academy launched the In Memory of Dylan Bucci Challenge on the World Community Grid. The challenge ran for 19 days to honour Dylan's age and the date of his passing, and united teams of volunteers around the globe to accelerate cancer research. By the end of the challenge, Sisler Cyber Academy ranked first among 65 active teams, generating nearly 500 million points through their remarkable efforts. Together with the other participants in the challenge, an equivalent of over 600 CPU years of computation was produced in only 19 days.

We would once again like to extend our thanks to Sisler department head Mr. Robert Esposito and the students of Sisler Cyber Academy for helping host the In Memory of Dylan Bucci Challenge. Thanks to them, and all the participants around the world, we continue to keep Dylan's legacy alive through the power of science and community while also accelerating cancer research.

Mapping Cancer Markers project updates.

We continue to investigate the 26 top-scoring genes that have been identified in MCM analyses as potential key markers of lung cancer. Most recently, we have explored the roles of DYNLT1, PDE8B, and ECD. Please refer to the respective research updates on our website to learn more about these markers that may inform future diagnostics and treatment options.

An exciting update on the Africa Rainfall Project!

Thanks to the continued efforts of the scientists at WCG and Delft University of Technology, we are happy to announce that the Africa Rainfall Project (ARP) has restarted once again!

Why are rainfall simulations so important?

Rainfall is incredibly important for agriculture in Sub-Saharan Africa, where most regions experience one or two rainy seasons and harsh dry periods in between. Indeed, over 95% of African farmers rely on rain-fed crops, closely tying food security to consistent rainfall. Despite this, weather forecasts in Africa lack the accuracy needed to make use of the sudden,

convective rainstorms that are common to the region. These may even be localized to a single farm, presenting a problem for farmers who rely on forecasts to determine when to plant their crops. Changing weather patterns caused by climate change are also a troubling factor, with significant decreases in rainfall expected across the continent.

How is WCG approaching the problem?

In response to these challenges, the ARP is building simulations that will drastically improve rainfall predictions through the use of a high-resolution (1 km) application of the Weather Research and Forecasting Model (WRF). Rainfall simulations are now about two thirds completed, and are expected to be fully complete within 12 months. The simulations' unique, fine-resolution coverage of the continent allows simulation of the abrupt and intense rainstorms that bring about 80% of its rain. These large-scale simulations being built by the ARP require an extraordinary quantity of computing power. As of August 8, 2025, WCG volunteers have helped to generate over 10.6M results for this project. We are grateful for your ongoing support.

You can read more about our ARP Research Update on our website, with a commentary by Prof. Dr. Ir. Nick van de Guisen of Delft University of Technology on the role of artificial intelligence in forecasting the weather.

Announcing the launch of Mapping Arthritis Markers!

Building on the success of the Mapping Cancer Markers project, WCG is excited to finally announce the launch of a new project: **Mapping Arthritis Markers (MAM).** MAM aims to pinpoint the molecular markers of arthritis, and to improve the early detection and management of this chronic, life-altering disease. We look forward to welcoming new and current volunteers to the project.

Why target arthritis?

Arthritis is an irreversible and degenerative disease that affects **over 7% of the global population**, leading to joint pain, reduced swelling, and long-term disability. There are over one hundred unique variations of arthritis that fall into two broad categories: osteoarthritis (OA) and autoinflammatory and immune arthritis (IAA). Each of these subtypes may require a unique therapeutic approach, and though treatment options for arthritis are expanding, there remains no cure.

Our limited understanding of arthritis signals an urgent need to accelerate arthritis research to improve the quality of life for our aging population. MAM aims to characterize unique arthritis subtypes by investigating the subtle changes in biological activity that "mark" the disease development process. These efforts will ultimately lead to earlier and more precise diagnostics and personalized treatment options.

What will MAM do?

The first phase of MAM will focus on **psoriatic arthritis (PsA)**, a painful subtype of arthritis that develops in up to 30% of people with psoriasis. PsA often goes undetected until after permanent joint damage has begun, owing to the lack of effective diagnostic tests for the condition. Moreover, the competing influences of genetic, environmental, and immune factors in PsA complicate predictions of disease progression and functional outcomes.

MAM plans to enhance our knowledge of PsA development by identifying biological markers and patterns that differ between healthy and arthritic tissue across thousands of samples. By supporting the MAM project and donating your device's unused processing power, you will be directly contributing to groundbreaking research with the potential to improve quality of life for millions of arthritis patients.

Though MAM is a major undertaking, we are confident in our ability to revolutionize early diagnosis and treatment for arthritis thanks to our dedicated community of volunteers. We invite you to join our growing team of volunteers and help forge a path towards a future where this disease can be caught early and treated more effectively. To learn more about the project and get involved, visit the Mapping Arthritis Markers project page on our website.

Team Ian Rides again!

Pictured: Team Ian Ride in their triumphant return to the road on their first ride since 2018.

June 1, 2025 marked the most recent Team Ian Ride in support of Ian's Fund for Computational Biomedical Research at the Princess Margaret Cancer Foundation. This was also the 9th time that Dr. Igor Jurisica took part in the ride as well, and the first ride for the team after a 7-year pause to catch their breath.

At Team Ian Gallery you can view images from past fundraising events, including those of several IBM-WCG team members, colleagues, past interns, and the current WCG technical team, Dylan. Although this year's ride was cut short by harsh weather conditions, Team Ian

persevered and cycled from Bromont to Montréal on June 1st. Thanks to the group's renewed commitment, this single ride raised an impressive $82,818.29 for Ian's Fund. We are blown away by every single rider who participated this year!

Remembering Ian

Ian's Fund was created in memory of Ian Lawson Van Toch, a passionate graduate student in the Department of Medical Biophysics at the University of Toronto. He had spent two summers in Dr. Jurisica's bioinformatics laboratory as an intern to develop tools and to investigate the key drivers of cancer with the hopes of finding a cure. He was just starting his research towards a master's degree when he passed away on August 24 2007. Ian was only 23 years old.

This year saw the launch of the Ride for Ian 2.0 to support Ian's Fund and the initiatives it has sponsored since 2008, including the following:

- **Ian Lawson Van Toch Memorial Award for Outstanding Student Paper:** presented at the annual conference of the Intelligent Systems for Molecular Biology, the world's largest conference focused on bioinformatics and computational biology.

- **Ian Lawson Van Toch Internship Award in Computational Biomedical Research**: awarded to dedicated undergraduate student-interns focused on computational biology and cancer informatics.

These awards have been instrumental in launching several successful careers in bioinformatics for several amazing students from around the world. In fact, WCG's very own Data Science Specialist, Dylan Bethune-Waddell, was the 2014 recipient of the Ian Lawson Van Toch Internship Award in Cancer Informatics. We believe he has put it to very good use since then.

To date, Team Ian has raised over $500K for Ian's Fund, and we are so proud of everyone on the team for continuing to uphold his legacy of devotion to research and passion for science. By continuing to ride in Ian's memory, they are following his example in creating opportunities for young scientists who want to make an impact on a global level.

Please consider donating to Ian's Fund through the PMCF website, and help bring opportunities to light for the bright young minds wanting to join the search for a cure to cancer.

Join the World Community Grid.

Thanks to the dedication of over 817,000 volunteers around the world, WCG has powered research on over 30 global humanitarian projects over the past 20 years. We appreciate you all for donating your computing power and supporting our mission of accelerating science.

As you may be aware, since 2021 WCG is supported primarily by the Jurisica lab's funding. This places considerable financial and technical constraints on our capacity to maintain and expand WCG initiatives. We need your support now more than ever before as we embark on our new project, MAM. We have continued our fundraising campaign, and have received $21,512.15 as of March 27, 2025. We are still searching for long-term partners, so please let us know if you have any connections who align with our mission and have the capability to support us.

If you would like to make a donation, there are multiple methods to do so, which are outlined below:

- One time donation directly to the WCG at UHN Foundation;
- Monthly donation directly to the WCG at UHN Foundation.

- Should you wish to receive a US tax receipt, please call UHN Foundation at 416-603-5300 or toll free at 1-877-846-4483 (UHN-GIVE).

Thank you to all the volunteers and donors who continue to support WCG. As a global research effort powered by individuals, we grow stronger with each and every contribution. Together, we are changing lives, one work unit at a time.