

# TechS News- An Electronic Newsletter

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## Editorial

Welcome to the 5<sup>th</sup> issue of TechS, an electronic newsletter reporting the information and updates on the activities of the Technology Innovation Platform (TIP) of PlanetS. In the current issue we have selected and invited the company EnduroSat to present some of their products and show their technological capabilities.

To make the newsletter a success, we will be relying on you, the subscribers to the newsletter, to send us news and update about something you think can be important to share within our community in terms of **Seed funding, Networking, Training, Participating, Infrastructures** and **Competences**. If you want to share information with the other subscribers to the newsletter and facilitate the exchange of information, just let us just contact the TIP [here](#).

Best wishes,

*The Technology Innovation Platform (TIP)*

## General information about TIP

General information about TIP's activities and news from the us can be found here:

- Webpage of TIP: [link](#).
- To subscribe or unsubscribe TechS: [link](#).

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## Update of the TIP web page

### New seed-funding criteria

You have a great idea which can be carried out with an industrial Partner to transfer knowledge or technology? The TIP proposes a permanent call for seed funding called “Call for Ideas”. The call promotes activities and strategies that aim at strengthen the knowledge and technology transfer between PlanetS Members, industry, technical universities and other research laboratories.

Who can apply and what are the conditions? The call is open to every company, institute or research laboratory, and the rules have been kept as simple and flexible as possible. In order to promote the develop of technology items which could lead an added value for PlanetS projects, an new criterion is available for you (*see #3. in the following numbered list*):

- The proposed ‘idea’ must be related to at least one of PlanetS’ Projects and its activities.
- The project must be co-signed by at least one PlanetS Project Member (or their contact persons) and at least one non-PlanetS Partner.
- It must be shown that the implementation of the idea can lead to at least one of the followings:
  1. A transfer of knowledge or technology from a PlanetS Partner to industry in view of a commercial application
  2. A transfer of knowledge or technology from the non-PlanetS Partner in view of a direct benefit of one of PlanetS’ Projects
  3. *Within the framework of a project supported by PlanetS, develop a high-risk technology item that could potentially lead to an added value for the project. Technology or knowledge transfer is in this case suitable but not strictly necessary (NEW!)*
  4. A market opportunity or a commercial product
  5. A patent
- The proposed project must not last more than 18 months and must be concluded by providing at least a detailed report and clearly identified deliverables.

Would you like to know more about the call? Have a look [here](#).

## Spotlight on a project of the TIP

How the PlanetS TIP knowledge exchange program got Miles Timpe into working with NetGuardians SA

As banks and other financial institutions continue to digitalize, identifying and preventing fraud will become increasingly difficult. Banks now routinely process millions of transactions per day and from a growing range of unconventional sources. Indeed, customers can now make purchases or transfer money from their laptop, a diverse range of smartphone apps, and even their watch.

This evolution in banking has made it increasingly difficult to combat fraud with conventional tools. On one hand, due to the sheer number of transactions, simply identifying fraud in financial datasets is like looking for the proverbial needle in the haystack. On the other hand, due to the novel ways in which people are interacting with their bank, never-before-seen types of fraud are emerging at an unprecedented rate.

The acceleration of digitalization brought on by the Covid-19 pandemic has only supercharged this problem. If one thing is certain, it is no longer feasible for banks to review and assess every anomalous transaction and sort the real frauds from the false alarms. Instead, they are increasingly relying on third parties that can offer sophisticated data processing pipelines capable of identifying and flagging suspicious transactions in near real time.

NetGuardians SA is a company offering just such a service. NetGuardians is an award-winning fintech company based in Yverdon-les-Bains that develops solutions to help financial institutions in over 30 countries to fight fraud. The core business of NetGuardians is banking fraud: monitoring the behavior of the customers of a banking institution allow to detect unusual behavior – resulting for example from the hijack of a user’s e-banking session – and prevent fraud before the money leaves the bank.

NetGuardians is always looking to improve and expand its fraud detection technology. In order to facilitate innovation in various areas of their service, NetGuardians approached the Knowledge Transfer Platform of PlanetS in the Spring of 2020. They proposed three projects targeting different segments of their fraud detection service, including a project on time-series analysis and seasonality detection. It wasn’t long before a member of PlanetS took interest in the project.

Dr. Miles Timpe is a postdoctoral researcher in computational astrophysics at the University of Zurich’s Institute for Computational Science. His research is focused on developing numerical tools to study the formation and evolution of Earth-like planets and their moons. These tools include a wide range of methods that can also be of use in industry, including physics-guided machine learning algorithms and large-scale data analysis pipelines. Outside of his academic research, he also has expertise in anomaly detection and large-scale data processing.

“During the six years that I have been a member of the NCCR PlanetS consortium, I’ve kept a close eye on the internship opportunities offered through the Technology Platform’s Knowledge Transfer program. In the past, these opportunities have generally been focused on areas outside of my expertise, such as optics, but when the opportunity to work with NetGuardians presented itself, I was intrigued,” Miles explained. “NetGuardians is a young and dynamic Swiss company tackling a challenging problem in the financial sector. Banking

fraud detection is a fascinating problem to work on and I was excited to take up a new challenge.”

Despite the complex Covid-19 situation, both parties were eager to move forward with the project. An agreement was reached for a three-month externship, starting October 2020. After navigating the constantly evolving Covid-19 regulations, Miles officially began the externship in mid-October, commuting by train from Zurich to the NetGuardians office in Yverdon. However, only a few weeks into the externship, the Covid-19 regulations tightened and home office became mandatory once again. Nonetheless, the externship proceeded smoothly. “It was a tricky and sometimes frustrating situation—with the uncertainty and everything evolving so rapidly—but my hosts at NetGuardians were always so easy-going and accommodating, which made dealing with the Covid-19 situation a breeze,” Miles recalls.

Thus, despite the pandemic, Miles was able to get right to work with NetGuardians. The analytical core of the NetGuardians service relies on an accurate modeling of the current and future behavior of bank customers, using only fragmented information coming from their past behavior. A key aspect currently researched by the NetGuardians R&D team revolves around the impact of recurrence in the data. Miles’ externship research project has been part of this effort. During his three months working at NetGuardians, Miles was able to quantify how the completeness of historical data affects the quality of the predicted behavior of the customers. He also developed a pipeline to identify the temporal trends and seasonality aspects present in the data and started an ongoing effort to correct from such effects to improve the prediction accuracy.

Miles’ externship was supervised by Dr. Vivien Bonvin, a former EPFL researcher now Data Scientist at NetGuardians. “I spent six years doing research in observational cosmology before moving towards applied AI. I know from first-hand experience what a researcher from academia is capable of. I heard from the PlanetS Knowledge Transfer initiative from colleagues I had during my time at the Geneva Observatory. Such initiatives are key in my opinion to give academics a glimpse of what working in the industry looks like, and to give companies a display of how useful and efficient academics can be. Since most researchers are going eventually to move to the industry, it is essential to build bridges so that both worlds can understand each other better. With NetGuardians’ ambition to propose cutting-edge analytics to its customer, there is always plenty of research topics to explore and the KT initiative was a perfect opportunity in that regard.”

Miles brought with him his advanced analytical knowledge and experience in time-series analysis. He developed tools and pipelines that contains advanced statistics, but also made sure to properly detail his thought process so that future developers can understand the core idea and goals – no black magic involved here.

In addition to his analytical skills, Miles also had a strong computational background which allowed him to be immediately at ease within the NetGuardians R&D framework. The technical implementation of Miles’ ideas was carried out directly within the proprietary research library developed at NetGuardians, which ensures a high reusability for future projects. Thanks to this, in addition to providing direct answers to questions NetGuardians had, Miles’ externship will act as a stepping stone for future research projects.

“Even though we saw each other face-to-face for only two days in total, it has been great fun to work together”, says Vivien. “Miles adapted to his new working environment very rapidly and was useful from day one.” A feeling shared by Miles: “The data science team at

NetGuardians was welcoming, good humored, and easy to get along with. I enjoyed immensely my time, even if only three months, with them. By a lucky coincidence, my direct advisor at NetGuardians, Vivien, was also an astrophysicist, so we spoke the same language!”

Given the realities of the academic job market, internships in industry are an invaluable experience for students and young researchers. “The externships offered through the Technology Platform’s Knowledge Transfer program are excellent opportunities for PhD students and postdocs”, says Miles. “Only a small percentage of us will remain in academia for the long run. Therefore, such opportunities are invaluable and virtually required in the move from academic to industry.”

In addition to gaining valuable industry experience, the externship was a welcome opportunity for another reason. As an American, Miles is part of the ~17% of Swiss university students, known as “third-country” nationals, who are not from either Switzerland or an EU/EFTA country. Due to restrictive immigration laws in Switzerland, normal internships are not an option for such students, making it nearly impossible to gain industry experience during their studies. However, externships such as this one offer third-country nationals a rare loop-hole.

“For those of us in NCCR PlanetS who are non-Swiss, non-EU/EFTA nations, these are generally the only internships in Switzerland that we are eligible for. Because our contract remains with the university, we are able to circumvent the usual barrier to undertaking an internship within Switzerland,” explains Miles.

Miles has since concluded his externship at NetGuardians, presenting the results of his work to the company in mid-January, and returned to his postdoctoral position at the University of Zurich. Miles and the team at NetGuardians remain in contact, hoping to expand on the work carried out during the externship in the near future.

More details about the program: <https://nccr-planets.ch/platforms/technology-transfer/funding-of-a-short-term-project/>

## Focus on a company: EnduroSat

As every month, this section wants to present an overview on a selected company which is active in domains related to the PlanetS' activities. This month, we are glad to present the company "EnduroSat".

EnduroSat is a space services provider for business, exploration, and science teams. Founded in 2015, the company's team currently exceeds 75 talented developers, engineers, and scientists. With an annual growth of 250%+, EnduroSat is one of the fastest-growing space companies in Europe.

### Shared satellite service

Shared Satellite Service by EnduroSat allows multiple customer payloads to be integrated on a single NanoSat at a fraction of the current cost and without the traditional complexity. The service streamlines space operations by covering all aspects of the process - from payload integration and launch to data command and control via simplified cloud-based user interface. Its goal is to help drive innovation at the final frontier by providing easy access to space to visionary entrepreneurs, scientists, and technologists. After the pilot mission in July, launches are scheduled every three months.

### Spartan

SPARTAN is the first of several upcoming Shared Satellite Missions, empowering EnduroSat's commercial partners and their space capabilities. It enables the easiest way to perform technology demonstrations as well as scientific and commercial programs without the need to operate your own satellite or ground infrastructure. The Shared Platform for Applied Research and Technology AffirmationN (SPARTAN) is a 6U CubeSat that will fly onboard the Falcon 9 rocket, carrying a total of 7 payloads on a single bus.

### Cubesat Platforms and Systems

EnduroSat currently has more than 180 systems in Space and provides CubeSat platforms in the 1U – 12U range. The company's product portfolio is recognized in the last two editions of NASA's State of the Art of Small Spacecraft Technology report.

EnduroSat's online NanoSat store includes a comprehensive space module catalogue with the industry's first satellite configurator.



For more information visit our website at [www.endurosat.com](http://www.endurosat.com)



## Breaking news

### Bench2biz workshop: save the date!

Bench2biz is a partnership between NCCR academic actors in high-technology fields to support aspiring entrepreneurs to determine rapidly the commercial merit of their idea or invention and offers a unique training within the entrepreneurial training market. More details can be found on the dedicated website <https://bench2biz.ch>.

Participants profit from an objective analysis of their very early stage idea that guides them to the identification of the best path forward as well as of the more challenging aspects of their project. A team of multidisciplinary professionals, including business and industry experts with real-life entrepreneurship or corporate experience, is brought around each champion to work together through specific modules. The workshop runs with an intense pace, provides practical tools, very little teaching, extensive teamwork and advance early-stage research performed by each team to be translated into real business opportunities. Our expert network includes coaches, industry representatives, IP specialists, TT officers, lawyers, etc.



The workshop has been running in Switzerland on an annual basis since 2010, attracting more than 50 ideas, about 350 community members, and empowering at least 18 start-ups. Since 2019, Bench2Biz has reoriented ourselves exclusively towards academic partners including the following NCCRs: [PlanetS](#), [Chemical Biology](#), [RNA&Disease](#), [TransCure](#), [Bio-Inspired Materials](#), [Kidney.CH](#) and [QSIT](#). The consortium is glad to welcome three new NCCR partners for the 2021 edition: [NCCR Microbiomes](#), [NCCR Dependable Ubiquitous Automation](#), and [NCCR SPIN](#).

*[The next event is scheduled on November 2021: save the date! Follow Bench2biz on LinkedIn and Twitter.](#)*

Post: <http://nccr-planets.ch/blog/2021/05/10/bench2biz-2021/>



## Funding programmes of the TIP

### Permanent call for seed funding

The TIP proposes a permanent call for seed funding called “Call for Ideas”. The call promotes activities and strategies that aim at strengthen the knowledge and technology transfer between PlanetS Members, industry, technical universities and other research laboratories.

The call is open to every company, institute or research laboratory, and the rules have been kept as simple and flexible as possible. Would you like to know more about the call? Have a look [here](#).

### Knowledge transfer with a short-term project

The TIP proposes a programme for PlanetS Members or Associates (PhD-student, postdoc or engineer) who have developed competences or ideas that could be applied to areas outside their specific research activities. The PlanetS TIP provides with up to 3 months of financial support (like a salary compensation) in order to pursue your project. Would you like to know more about the opportunity? Have a look [here](#).

Different 3-month projects are available for PlanetS Member or Associate:

- Development of a qualification setup for micromirror with Sercalo Michrotechnologies Ltd.
- Label propagation and Pyspark implementation with NetGuardians.
- Optical performance simulation of black body instruments with Micos Engineering.
- Concept of a Lasercom ground station under strong atmospheric turbulence with Officina Stellare SpA.

If you are the company or the research laboratory which would like to propose a project, let us know about your interest and fill out the following: [proposal of a short-term project with for the external partner](#).