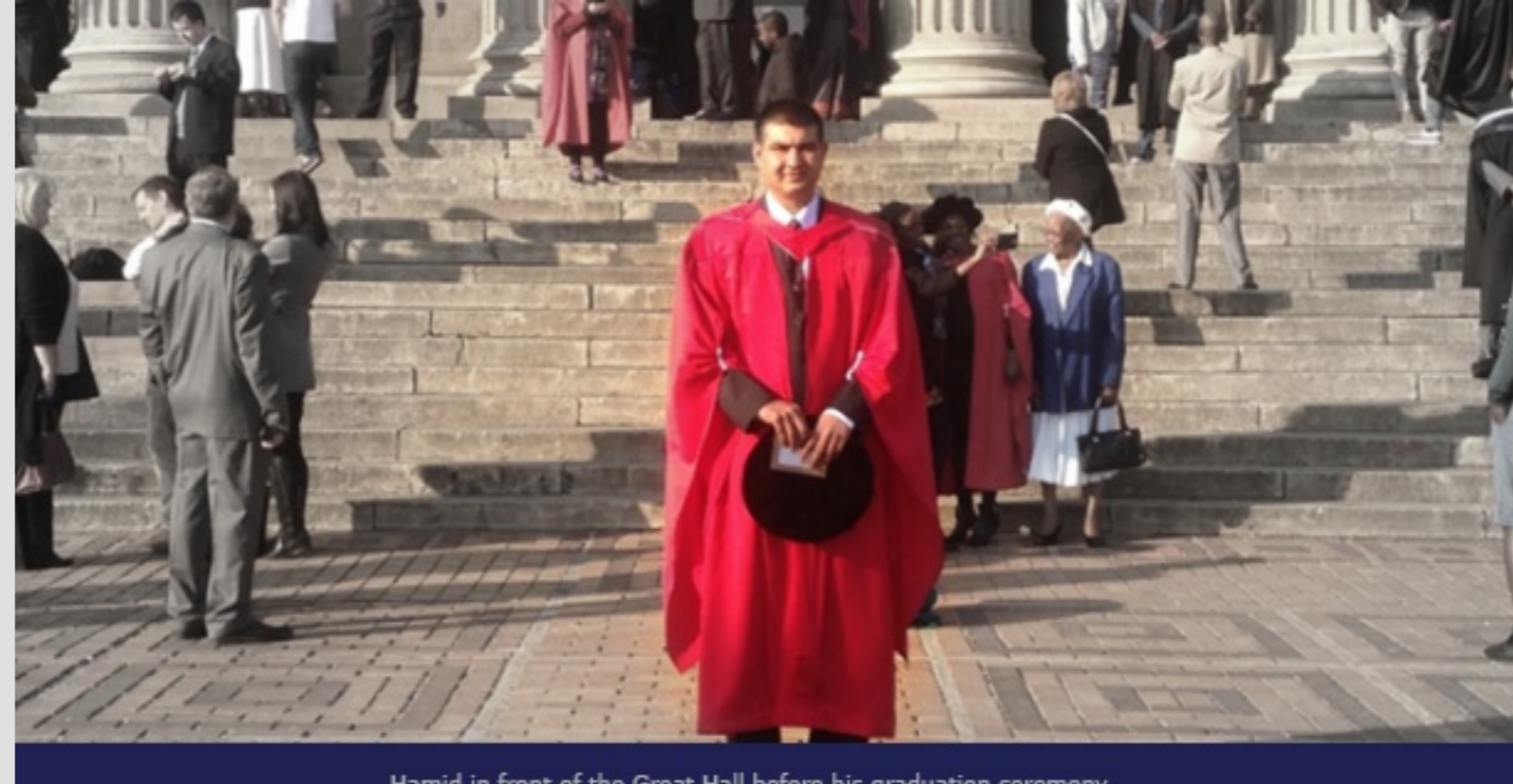


FROM THE DIRECTOR'S DESK

Welcome to the Future: Embracing 21st Century Mining

Welcome to the second newsletter of the WMI. Let me start with two exciting achievements since my first newsletter: Hamid Ashraf has been awarded his PhD (we described his research in the [previous newsletter](#)); and Sibanye-Stillwater announced their continued support to Wits by converting the traditional donation agreement into a partnership for mutual benefit.



Hamid in front of the Great Hall before his graduation ceremony.

This substantial investment will mean that DigiMine now becomes the Sibanye-Stillwater Digital Mining Laboratory, hosting the Chair in Digital Mining and Mine Automation – a post that is also sponsored by Sibanye-Stillwater ([read here](#) about the recent handover of the cheque). In addition, we have established a Steering Committee to guide the Sibanye-Stillwater/DigiMine research agenda and have aligned our technology and innovation plans to action our partnership for 21st century mining and mutual benefit.



A R15 million further investment in Wits University is handed over by Sibanye-Stillwater CEO Neal Froneman (third from left)

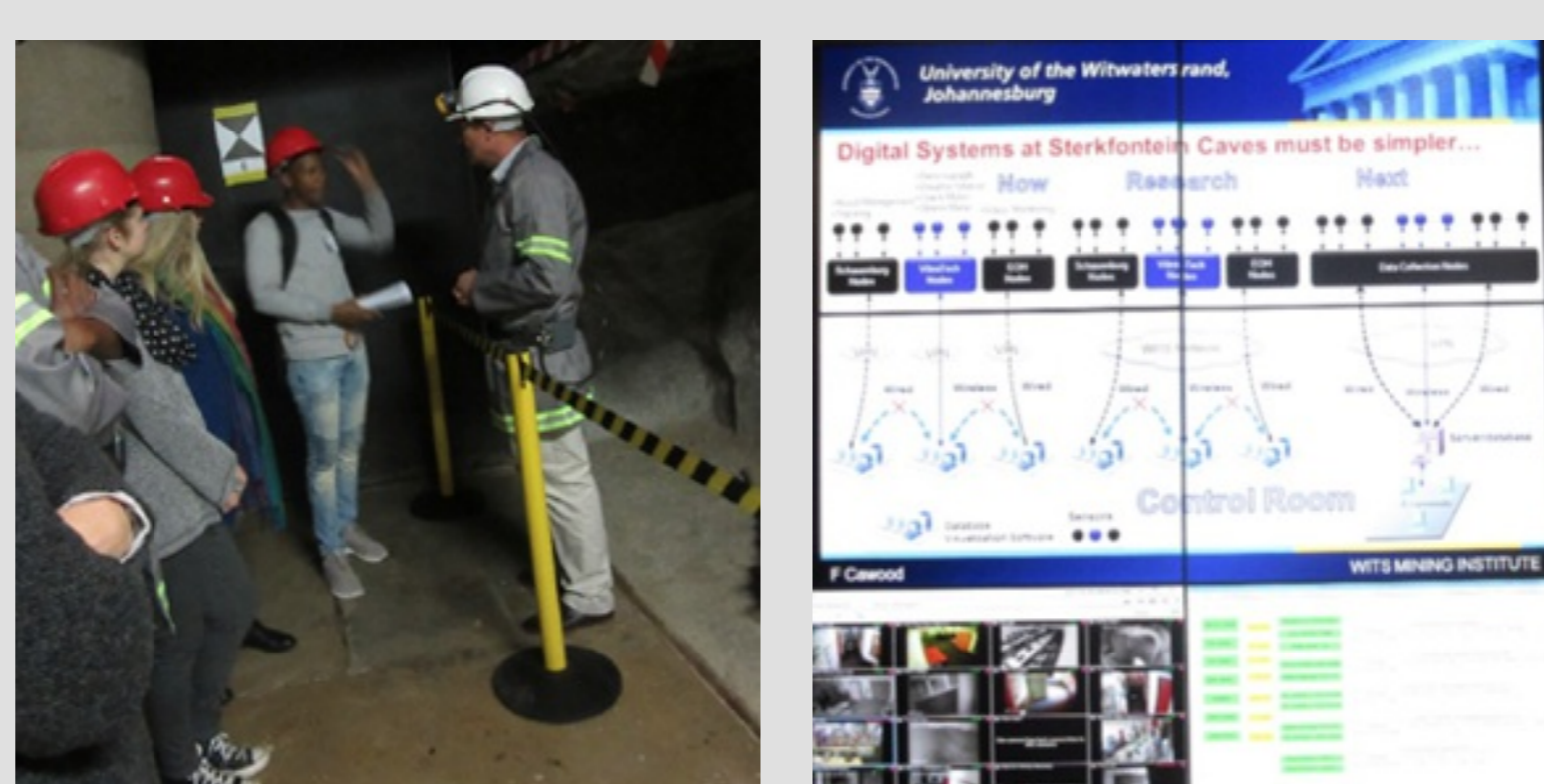


As part of the preparation for investment in DigiMine, Sibanye-Stillwater's technology and innovation plan has been aligned with the vision and mission of the WMI through a monthly meeting with Alex Ferns.

The WMI also participated in the Wits programme for National Science Week in August. The laboratory attracted significant interest from school learners of all ages, teachers and parents; most were surprised by the amount of technology in mining, and by the opportunities for different occupations to work together in the 'city-below-the-city'.



We need science to know who is doing what in the mine; it is similar to what satellites do when orbiting the earth.



"I never knew that a mine is like having a city underground – it is exciting!"

The view in the control room: the IBM Video Wall is 'wow'!

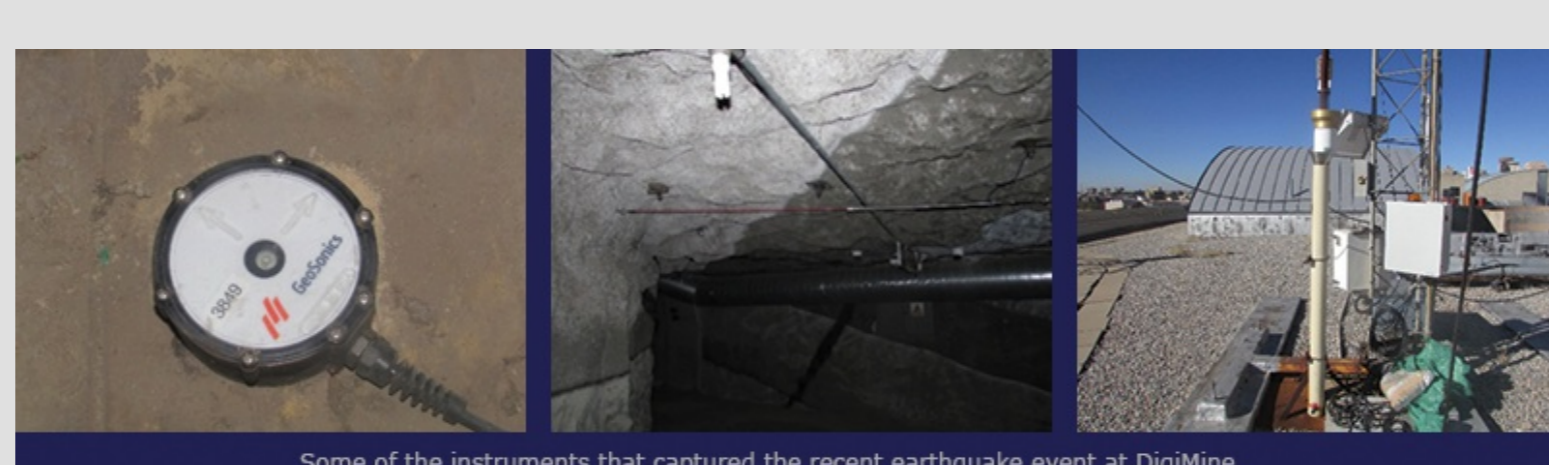


Inside Nick's tunnel: mining is exciting – and it's all about technology.

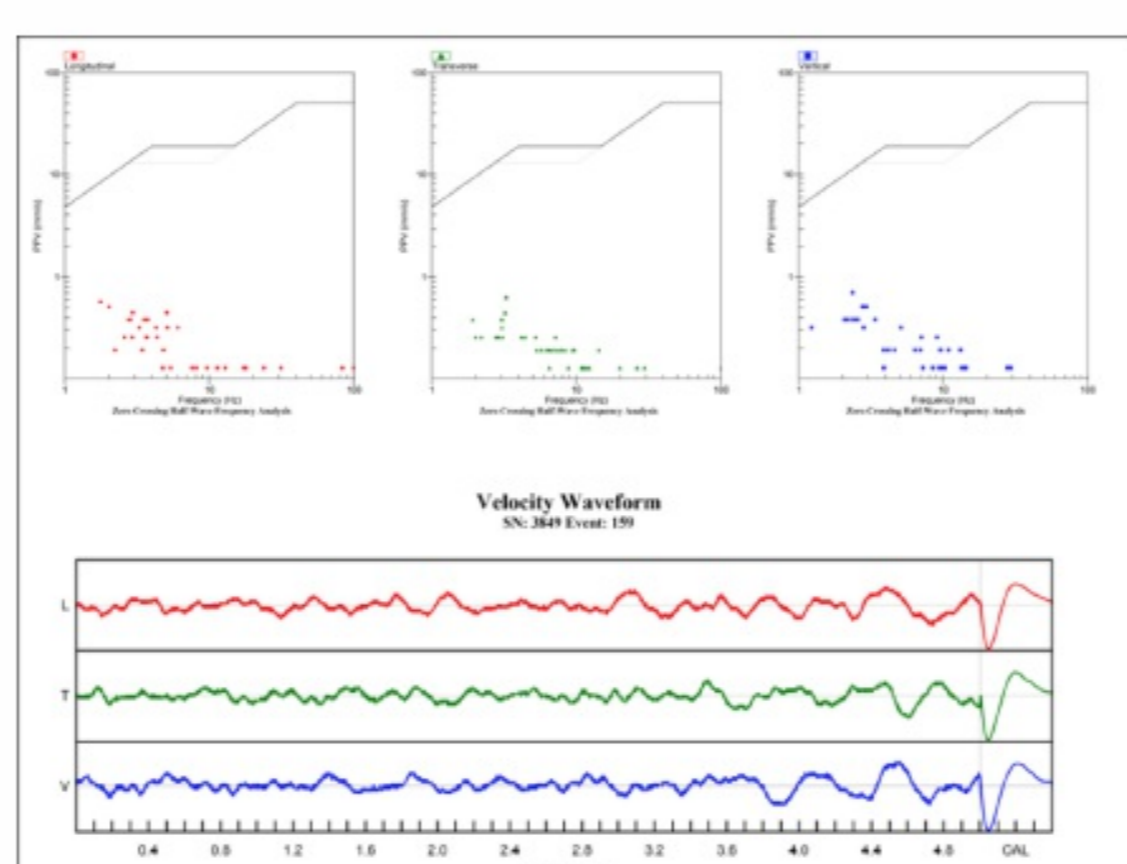
While space limitations in this newsletter make it hard to decide what to tell you about in detail, I would like to highlight DigiMine's recording and measurement of the vibrations caused by the recent earthquake in Botswana. Our technology partner in this area is VibraTech, and Joseph Kwiri is the full-time researcher on rock engineering and seismicity under the co-supervision of the Rock Engineering staff (Professor Rudrajit Mitra and Mr Tawanda Zvarivadza) in the School of Mining Engineering.



Towards a regional understanding of seismicity and its impact on mining: the Botswana earthquake in perspective.



Some of the instruments that captured the recent earthquake event at DigiMine.



Analysis of the vibrations as they were felt at Wits, as a result of the Botswana earthquake.

This was our first event captured by the VibraTech system and a good test for checking system functionality and performance. We noted several problems and the trivial ones have already been corrected in preparation for the next event. We have also identified longer-term improvements such as dealing with delays in integrating camera visuals, as well as optimising data-flow time lags by a combination of improving system architecture and antennas. Most importantly, we identified the opportunity for 'regional' interpretation of seismicity data by adding external seismic sensor data. We are hoping that more knowledge will improve our understanding of seismicity events and lead to better design of underground excavations and support. Joseph's summary note is available on our website if you want more detail.

This is what makes the WMI different: all our researchers get the opportunity to work on real-life issues, because our work is informed by real-life problems. For instance, we are also working with Gold Fields on the application of 3D scanners mounted on moving platforms to address rock engineering problems – but I will leave this for a future newsletter.

To conclude, thank you for the many complementary and encouraging comments on the WMI's first newsletter, and welcome to those readers who asked to be included on our circulation list. Our passion is 21st century mining and the WMI's contribution is to inspire our talented team researchers to make mines safer and more efficient by embracing new technologies.

We are working towards a grand launch of the Sibanye-Stillwater Digital Mining Laboratory in the first quarter of 2018, when we will also show-case our research projects and plans at a mini conference. Until next time, let's spread the good news that 21st century mining is smart, safe and exciting!

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