

# 35<sup>TH</sup> INTERNATIONAL GEOLOGICAL CONGRESS

27 AUGUST - 4 SEPTEMBER 2016 | CAPE TOWN, SOUTH AFRICA



PRE 13

## Western Kaapvaal Craton

TRIP LEADERS: Prof Wlady Altermann and  
Ms Vusani V Mathada (Bsc Hons)



**Archean - Proterozoic sedimentary transition, volcanism, structural geology, early life, stromatolites, and glacial deposits between 2750 and 2220 Ma. BIFs and world's largest Fe and Mn deposits**

The Transvaal Supergroup in the Griqualand West basin encompasses magnificent exposures of sedimentological superlatives of the Archean and Paleoproterozoic. The excursion will start at the crystalline basement and the unconformity below the Ventersdorp Supergroup. Basal conglomerates and tuffaceous sandstones at the base of the Ventersdorp Supergroup, displaying the world's oldest raindrop and hail imprints in a volcano – sedimentary – lacustrine succession, including some 2.7 Ga Stromatolites, will be visited.

The unconformity between the Ventersdorp Supergroup, the basal conglomerates of the Transvaal Supergroup, the overlying beach deposits and the following transgressive sequence of marine carbonates and banded iron formations will be demonstrated. The outcrops include the world's largest Neoproterozoic stromatolitic carbonate platform succession, with very well preserved and extensive stromatolite reefs and an excellent record of cyanobacterial and bacterial microfossils, recording the early history of life on Earth.

These carbonates are transgressed by economically important, laterally extensive banded iron-formations containing some of the world's largest iron and blue asbestos deposits. Succeeding sedimentary and volcanic units host a record of the Early Proterozoic Snowball Earth. Overlying this succession are the world's largest manganese deposits.

Stratigraphic units examined during the excursion host the "Great Oxidation Event", which will be discussed in scientific sessions with the thread Origins and Evolution. Participants in the Geomedicine session will be interested in the blue asbestos (crocidolite) deposits at Koegas-Westerberg (former world's largest crocidolite mining district) and the mining history and the implemented measures of environmental restoration.

The above geological superlatives, regional geology aspects and subjects of palaeo-climate and the early evolution of life on Earth, stromatolites and microbialites in marine and lacustrine environments, raindrop imprints and an evolution of a classical carbonate platform will be discussed together with metallogenesis and Fe, Mn, Pb/Zn (world's oldest MVT) deposits. Famous mining towns like Sishen, Hotazel, Prieska (Fe, Mn, Asbestos) and famous stromatolites (Boetsap) and Paleoproterozoic glacial localities (Uitkoms) will be visited.

The excursion will start and end in Kimberley, which is a developed mining town with a well frequented airport and with good hotels and guest houses. Thus participants will have an opportunity given for private visits to the spectacular, arid, Galagadi (Kalahari) National Park, Augrabis Falls (one of world's largest waterfall falls, when in flood season, Orange River).

A visit to the world famous Kimberly Big Hole Diamond Mine and museum will be part of the last day of the excursion. From there on, participants have to make their own arrangements of flights of car rental to Cape Town. Several spectacular routes and *en route* visits to national parks and attractive tourist places are possible. The excursion organizers will provide a list and map of possibilities.

**Field Trip Leader: Wlady Altermann University of Pretoria**

**Start: Kimberley**

**End: Kimberley**

**Dates: 10 days, Wednesday 17th to Friday 26th August 2016**

## ITINERARY

<b>17-Aug-16</b>	<b>Wednesday</b>	Meet at the Road Lodge in Kimberley Enjoy this evening's dinner at the Hotel Overnight Stay overnight at Road Lodge
<b>18-Aug-16</b>	<b>Thursday</b>	<b>Kimberley – (Khoi San and Ongersriver farms)</b> Meet in Kimberley. Drive from Kimberley over Britstown to Omdraaisvlei (c. 250 km; Khoi San farm and Ongersriver farm), for Ventersdorp Supergroup: Archean basement, basal, c. 2.7-2.8 Ga Ventersdorp conglomerates sandstones, raindrop imprints, tuffs, lavas and stromatolites. Evening: drive to Prieska (c. 65 km) and check inn in the Prieska River View Lodge Overnight at River View Lodge in Prieska BB
<b>19-Aug-16</b>	<b>Friday</b>	<b>(Soetvlei farm)</b> Drive back towards Britstown, c. 45 km. Visit stromatolitic carbonate platform (Prieska facies, Nauga Fm., oncoidal, domal, columnar and conical stromatolites and transgressive carbonates). Outlook point over the Orange River valley and first encounter with BIF and structural geology of the south-western Kaapvaal craton. Overnight at River View Lodge in Prieska BB
<b>20-Aug-16</b>	<b>Saturday</b>	<b>(Windpomp and Noug farms)</b> Drive to Noug Farm, c. 80 km (towards Merydale/Westerberg). Transvaal Supergroup: Unconformity above Ventersdorp rocks, basal conglomerates, transition to quartzites, beach and aeolian deposits, transition to carbonates, transition to BIF, structural geology of SW craton edge. Overnight at River View Lodge in Prieska BB
<b>21-Aug-16</b>	<b>Sunday</b>	<b>(Prieska and de Duine farms, c. 100 km one way)</b> Prieska carbonate platform; shallow and deep water facies, drowning of the platform, transition to BIF. Structural geology in BIF, thrusting and folding, stratigraphy, De Duine – Westerberg Overnight at River View Lodge in Prieska BB
<b>22-Aug-16</b>	<b>Monday</b>	<b>(Witvlei and Uitkoms farms)</b> Drive to Uitkoms farm (c. 130 km), for Makganyene Paleoproterozoic glacial deposits, Snowball Earth and the stratigraphic and structural relationship to the underlying and overlying formations. Drive to Kuruman (c. 270 km) and stay overnight in Hotel, in Kuruman Overnight at El Dorado Hotel BB
<b>23-Aug-16</b>	<b>Tuesday</b>	Visit the Fe-Kolomela mine (Kumba/Anglo American) and beneficiation plant. (Discussion of Fe enrichment of supergenic versus hypogenic processes, paleo-climates and paleoweathering). Overnight at El Dorado Hotel BB

<b>24-Aug-16</b>	<b>Wednesday</b>	
		Drive to Hotazel or/and Black Rock (c. 60 – 80 km) for visiting a manganese mine and beneficiation plant. Discussion on world's largest Mn deposits in BIF setting Road geology and old Mn and Fe mines in paleo karst setting
		Overnight at El Dorado Hotel BB

<b>25-Aug-16</b>	<b>Thursday</b>	
		Drive to Boetsap (c. 140 km) and the "Boetsap Waterfalls" for giant stromatolite domes and stromatolite cyclicity. Discussion of stromatolite morphology and facies <i>versus</i> stratigraphy Late drive to Kimberley (c. 110 km) and check inn for Hotel in Kimberley.
		Overnight at Road Lodge Kimberley

<b>26-Aug-16</b>	<b>Friday</b>	
		Visit to Kimberley Big Hole Diamond Mine and museum and to flamingo lake. Transfer to Kimberley Airport for your flight to Cape Town.

**Minimum Numbers 10**  
**Maximum Numbers 20**

**COST INCLUDES:**

- 1 Night's accommodation at Road Lodge Kimberley on a BB basis
- 4 Night's accommodation at Prieska River View Lodge on a BB basis
- 3 Night's accommodation at El Dorado Hotel on a BB basis
- 1 Night's accommodation at Road Lodge Kimberley on a BB basis
- 9 x lunch
- 10 x dinner
- Transport in private touring vehicles
- Local English speaking driver on all transfers
- Driver meals & accommodation where necessary
- Direct flight from Kimberley to Cape Town

**COST EXCLUDES**

- All other accommodation
- All other meals
- All other transport
- All other sightseeing
- Personal expenses such as tips for meals, gratuities for guides & drivers, all alcoholic and other beverages, telephone calls and laundry
- Any other services not mentioned above