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## THE EVEREST OF IMPACT CRATERS

South Africa's Vredefort Dome is a Wonder of the World

By GRAEME ADDISON

The world's biggest impact crater, in the heart of South Africa, ranks with other major African landmarks like the Victoria Falls or Kilimanjaro.

Yes, it's that impressive.

### TOO BIG TO SEE

The problem with it is that it is hard to see and understand. You can climb Kilimanjaro or look at Vic Falls. But the Dome and its surrounding crater can only be seen as a whole from space. The first pictures were taken from the Space Shuttle in the 1980s and it was then that the world geological community sat up and said: Hey!

But it all needs to be explained and shown in detail.

### GOLD!

The Witwatersrand, source of South Africa's huge gold wealth, can be regarded as the third "ring" or remainder of the outer rock formations of the crater, of which the Dome around Parys and Vredefort are the central core. Most Johannesburgers have no idea they are living on the edge of a massive meteorite crater. It's as if they were living on Everest and didn't know it was the world's highest mountain - or even that it was there!

A second problem is that the Dome is very old and eroded. It is hard even to know how big the impact crater really was originally. The asteroid that hit here 2 billion years ago (nearly half the age of the earth) completely vaporised itself in the biggest energy release of which we have any record on the Earth's surface. Estimates of its size and the speed at which it was going depend on assumptions, some of them dubious, about the physics of the blast.

A recent estimate puts the size of the rock at between 22 and 25 km in diameter. More conservative estimates are 8-15km. The rock was a chondrite asteroid comprising silica, water and some iron. It was speeding at between 70 000 and 100 000 km per hour. The energy release amounted to millions or even billions of Hiroshima sized nuclear bombs.

The blast upended the Witwatersrand rock strata containing the world's largest deposits of gold. Parts of the gold reef poked out of the ground where it was discovered in the 1880s, after which our economy literally exploded. Some 55 000 tons of gold have been extracted, and we have the meteorite to thank for this. It shaped our modern history.

## MORE FIRSTS

One of the most fascinating facts about the area is that you can literally see the Earth's crust on edge, in the succession of rock formations from the perimeter of the crater to the inner core. This is all very accessible by public roads. Thus the entire structure is an outdoor classroom of great importance for researchers, students, schools and educators of all kinds.

Another fact is that the Vaal River is the only major river on Earth to flow through an impact crater, and the river itself is one of the oldest on the planet. It certainly occupies what may be the oldest river catchment on Earth, the Witwatersrand basin, that dates back 3 billion years. Here too the first continent on Earth was formed in what is now both Southern Africa and Western Australia.

Phenomenal events and facts need to be explained, imaginatively, to visitors who otherwise don't realise what they are looking at.



## TOURS

Since my wife Karen and I settled in the area in 2001 much more information has become available. UNESCO declared the Dome a World Heritage Site in 2005 and since then it has brought scores of overseas visitors to our doorstep, along with many curious South Africans.

Given all of this it is amazing that the SA Government has failed, so far, to legislate the Dome finally in terms of its status as a Unesco World Heritage Site. Far too little has been done to publicise it or provide display centres, signboards and public access to the Dome.

One little known aspect that should be fully developed is the battlefields history. The northern Free State, North West Province and Gauteng - areas covered by the crater - contain many significant battlefields. Call it the Crater of Conflict. Black, Boer and Brit armed forces have fought over this rich farmland terrain for centuries. We do a battlefields tour focusing on the Voortekker/Matabele wars and Anglo-Boer wars. There's much more to do. The Sharpeville Massacre occurred within the region, and guerillas bombed Sasol during the freedom struggle.

## EXPERTISE

We should all care to get the thing properly stamped on the map. In the absence of full government commitment, what tour guides are essentially doing is leveraging scientific knowledge of the Dome for visitors. Those who come here have a choice of ways of doing the Dome. They can drive, hike, raft, canoe, fly or just take a briefing and go see it for themselves with a map we've developed. We also invite academic researchers to lead on-the-ground explorations for those visitors who really want to get down and dirty.



Though not a geologist myself I've written a dozen books on aspects of science, technology and also tourism. As a generalist I am able to interpret the technical and analytical literature produced by specialists. I'm currently working on an illustrated guidebook to the Dome. My little 20-page booklet with a self-drive map is the start of it.

## VISIT US

Come and see for yourself. Bring a group. We have accommodation in a wonderful setting at Otters Haunt Eco Retreat on the Vaal River ( <https://otters.co.za/> ). Free tour for group convenor over 10 paying. Commissions to visiting guides.

HEART OF THE CRATER: <https://vdome.co.za/>

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