Shanti Rajagopalan
25 December 1960, Coimbatore, India – 7 May 2010, Melbourne, Australia

by David Boyd

Dr Shanti Rajagopalan was one of the best known and respected members of the ASEG. She was also one of the most all round talented members whether it be straight geophysics, her grasp of mathematics, her bursts of originality or the bubbling personality and sense of fun which delighted all who knew her.

In addition Shanti had a wide range of experience. She had been a visiting research fellow at the prestigious National Geophysical Research Institute in Hyderabad; she was a lecturer in the University of Adelaide; she worked for a short while with the airborne survey unit of the Bureau of Mineral Resources (BMR, now Geoscience Australia); she spent four years working for CRA/Rio Tinto in exploration geophysics working in Australia and South East Asia; and then as an independent consultant with her own company Earth Geobytes, she was a member of the BHP Billiton team which interpreted the results obtained by the revolutionary Falcon airborne gravity gradiometer unit. Wherever she worked she left her mark of fresh ideas and improved processing and interpretation procedures.

Shanti combined her enormous talent with the ability to think and act quickly. When a student in an adjacent room spilled strong acid in his face it was Shanti who took control although there were more senior people present, got the student under the emergency shower and sent a message to the University medical office.

Shanti obtained her BSc with 1st Class Honours from the University of Madras; her MSc from the Centre of Exploration Geophysics, Osmania University, Hyderabad; and her PhD from the University of Adelaide in South Australia.

C. C. Babu, a classmate from Hyderabad, wrote

> *She is from a family known for its academic brilliance. She comes from Coimbatore in Tamil Nadu State. Her love of geophysics brought her all the way from Coimbatore to the Centre of Exploration Geophysics, Osmania University, Hyderabad headed by Prof. VLS Bhimasankaram. …She was the only girl student in our class but she had no worry about it as her passion was geophysics. She was well known in the department among the senior professors and fellow students. Normally girl students hesitate to go on field works. But such a question did not arise in the case of Shanti because of her love of Geophysics… She was simple and very social. We all enjoyed her company. She was the topper in our batch. But she did not have any air of being top.*

Shanti continued to carry on as she started; she just became more experienced. Twenty years later Mark Dransfield describes vintage Shanti when he writes,

> *Shanti worked for BHP Billiton in the FALCON airborne gravity gradiometer interpretation team for four years from October 2004. She worked across a wide variety of commodities and geological settings and her considerable technical skills meant she was able to contribute new ideas and excellent interpretations to every project she worked on. Equally important was Shanti's skill in communicating her new ideas and her obvious joy and enthusiasm in her endeavours. She made our workplace more interesting and enjoyable. Personally, I was always impressed by Shanti's unusual combination of a very strong mathematical ability and geological and geophysical understanding.*

Greg Walker the interpretation team leader echoed this opinion.

> *From my side the thing that struck me about Shanti was her continued drive to innovate in everything she did. In every Falcon interpretation project that she worked on, she introduced a new method in treating or visualising data, or a fresh approach to the exploration problem. She constantly questioned the status quo.*

One of Shanti's special concerns was the quality presentation of magnetic data. If this is done badly the opportunity to see subtle signals in the images created from the data is lost. She taught her students the significance of colour and on one occasion she told them that 'Brown is not a good colour' and then in an afterthought, and with a typical smile in her eye 'except for skin'. Those students never forgot her message about presenting data; she was a born teacher.

Michael Morse tells of her activites during her short period of employment with BMR.

> *Shanti worked with Peter Milligan and me on the first pixel maps we released and together we published a paper on the subject, 'Pixel map preparation using the HSV colour model'. Shanti was dynamic, and for the short time she worked at BMR she influenced the way we thought and worked as scientists and had a lasting impact on the methods that were used for publication of the geophysical pixel maps.*

> *I met her at the 2009 ASEG conference and she was the same Shanti I remember stirring up our science and in some ways our lives...I will always remember Shanti as a dynamic insightful and good person who challenges me and made me a better person and scientist.*

It was around the turn of the century that Shanti became very active in ASEG affairs. She was president of the Melbourne branch in 2001 and 2002 and was involved in organising the first and so far only ASEG conference held in Hobart. She was an Associate Editor of *Geophysics* from 1998 to 2009 and the editor of *Exploration Geophysics* in 2000 and 2001. She won

the best paper at the conference in 1997, a best poster at the conference in 2000, so that with the Laric Hawkins award at the 5th conference in Perth, Shanti joined the exclusive group of members who have received three awards from the Society.

It was at the 5th ASEG conference in Perth in 1987 that Shanti established herself as a rising star in the field of mineral exploration. By noon on the first day delegates at the conference had registered the presence of Shanti. This was not surprising for you could hardly overlook a graceful young woman wearing a sari in the group which was predominantly male: but it was clear to all who talked to her that she was not only a pretty figure but also very well informed on technical matters. This was confirmed to all in the final session of the Perth conference when she received the Laric Hawkins Award for the most innovative paper with the title 'The use of "automatic gain control" to display vertical gradient data'.

Shanti was overcome at the announcement and her typically modest response was 'It was obvious'. Of course it was obvious to somebody as bright as Shanti.

The method is widely used today and is regarded by many as a standard procedure used in processing data to such an extent that many of the postgraduate students use it without attributing it to its original creator. This is probably typical of much of her work which was very practical and readily applied, and because it was developed in the course of teamwork it has not always been recognised specifically as her contribution.

At the 21st ASEG Conference in Sydney, held 23 years after the 5th conference in Perth, several people could remember Shanti's contribution to the Perth conference and a few could remember the topic of the paper for which she received the award. However no one could remember the principal overseas speakers and visitors – Dr Stan Ward, Dr Tony Barringer and Dr John Bonniewell – such was the strong impression that Shanti made on people.

There were two important consequences of Shanti's success at the Perth conference, apart from her being widely recognised in the mineral exploration community.

Until 1987 there were a few very competent women working in the mineral exploration industry but they maintained a low profile. It was being gradually appreciated within the community that women had the potential to make a greater contribution but it was a slow matter for this to be accepted. When Shanti received the Laric Hawkins award, senior managers within the industry were made aware of the talent going to waste. At the same time as Shanti's reputation became high-profile and her success at the Perth meeting became known to the next generation of women students, other women were encouraged to persevere with studies in geophysics. It was from the early 1990s that more women joined the industry following the lead given by Shanti. Although not many of them may be aware of it, Shanti's confidence, enthusiasm and talent changed the attitude of their male colleagues and paved the way for their professional achievements.

Shanti was concerned with the problems that remnant magnetisation introduced into the interpretation of magnetic data. Phil Schmidt writes,

> *Shanti was acutely aware of the effects of remnant magnetisation in magnetic interpretation. She interpreted magnetic anomalies of magnetite bearing sediments in the Mt Lofty Ranges to indicate that the sediments were remagnetised during the early Delamerian Orogeny, before significant folding had occurred. Subsequent laboratory studies at CSIRO in Sydney of these sediments fully support her interpretation, results of which will be published posthumously in a special volume of the Australia Journal of Earth Sciences as 'Magnetic overprinting of the Brachina Formation/Ulupa Siltstone, Southern Adelaide Foldbelt, prior to Delamerian deformation' by Shanti Rajagopalan, Phillip W. Schmidt & David A. Clark. An oral paper of the same title was given at the Australian Earth Science Convention in Canberra last July.*

> *In 2000 Shanti presented a paper at the 14th ASEG conference in Perth with her co-author Asbjorn Christensen extolling the virtues of magnetic tensor gradiometry: as always at the cutting edge. The last sentence of their 2000 abstract reads 'Just as with airborne gravity surveys, the measurement of the gradient tensor of the magnetic field is likely to prove the next major breakthrough in magnetic surveys'. This is why the session on the magnetic gradient tensor and innovation was dedicated to her memory at the 21st ASEG Conference.*

Such was Shanti and her contribution to geophysics in Australia and in India. Her loss to the science as a source of fresh ideas will be lamented but she will not be forgotten by those of us who met her and were inspired by her example.

Shanti is survived by her husband, Andrew Trevorrow, and her daughter, Janaki, in Melbourne and by her mother, her brother and three sisters in India.