

INDIAN ACADEMY OF SCIENCES

C.V. RAMAN AVENUE, P.B. NO. 8005, SADASHIVANAGAR,
BANGALORE 560 080, INDIA

Prof. V. Krishnan
Secretary

24 April 1991

Prof. P.C. Vaidya, F.A.Sc.
34, Sharadanagar
Ahmedabad 380 007

Dear Prof. Vaidya,

The Academy would like to publish in the next issue of the Newsletter an obituary of Prof. V.V. Narlikar who died during the beginning of this month. As you probably know, Prof. Narlikar has been one of the founding Fellows of the Academy. It has been suggested to us that as one of his students, you would be the most appropriate person to write an obituary on Prof. Narlikar. We would be grateful if you could kindly accept our request and send us a draft obituary on the life and work of Prof. Narlikar in about 3 or 4 typed pages. Some material about Prof. Narlikar available in our files is enclosed which may be of some use to you.

Since the next Newsletter has to go for print we would request you to kindly send us your write-up by the 10th of May.

With best regards,

Yours sincerely,

V. Krishnan

Looking Back

1. 2. - 85

V. V. NARLIKAR

My research career began in 1930 and ended in 1973. The ocean of science about me was visited by numerous storms during this period and it was not easy to keep one's head above water all along.

I passed the Mathematics Tripos II in 1930 winning the highest distinction of the time, 'B Star' along with several others : besides I was awarded the Tyson Medal and Prize for Astronomy. ✓ I began work under Professor H. F. Baker ✓ who had lectured to us on "Brown's Lunar Theory". In July 1930 I began work on Liapounov's famous paper on rotating fluid bodies. In September 1930 I gave a written review of Liapounov's method, work and achievements. Professor H. F. Baker was too busy with other work and he sent my review to Professor Sir Joseph Larmor under whose guidance I was to work further. As a result of the work I was awarded an Isaac Newton Studentship of £250 a year for one year only in the first instance, in October 1930. A year afterwards the award was made for three more years. I had already begun work under Professor Sir Arthur Eddington on Relativity and Eddington's Fundamental Theory. The first ten items of the list of publications refer to this period at Cambridge where I was awarded a Rayleigh Prize in April 1932 for distinguished research work.

57

In May 1932 I returned to India with the intention of resuming my work at Cambridge for two more years from October 1932. However, the Banaras Hindu University offered me excellent opportunities of teaching and research in August 1932. I accepted the offer and continued there till 1960. //

It was at Banaras that I had opportunities to learn and teach many topics in mathematics such as (1) Modern Algebra (2) Groups, characters and applications (3) Wave Mechanics (4) Spinors and their applications (5) Hilbert's space and Quantum mechanics (6) Stellar structure as it developed after 1940 etc etc. /

Methods of mathematical physics, statistics, higher dynamics and the potential theory were parts of compulsory courses for M. A. - M. Sc. students of mathematics. Teaching helped me to understand a subject better and it stimulated research. Apart from my research students several lecturers in physics and engineering attended my lectures. Gradually a group of research students was formed. The University gave every encouragement for the research programme.

I reproduce a copy of "A Note on the Research Activity of Professor V. V. Narlikar and his colleagues 1947-72" sent to the INSA office on 21.11.1972.

Note of 1972

" A note on the Research Activity of
Professor V. V. Narlikar and his colleagues
(1947 - 1972)

(Note : Professor V.V. Narlikar was professor and head of the department of Mathematics of the Banaras Hindu University up to July 31, 1960. From August 1, 1966 he has been Lokamanya Tilak Professor of Applied Mathematics at the University of Poona. The present account is connected only with the more important work carried out, either under his guidance or in consultation with him by his pupils and colleagues or by him on his own. Many of the papers have been jointly published with him. During the period 1960 - 1966 when he was Chairman of the Public Service Commission, Rajasthan he was able to advise his pupils at Banaras with reference to their incomplete investigations and subsequent publications.)

In 1947 Dr K. R. Karmarkar had produced a number of interesting papers on the problem of equivalence of metrics but the two papers which received considerable attention later, in the research investigations in general relativity were the joint paper on the curious solution of Einsteins' field equations ⁽⁴⁷⁾ (vide "Einstein Spaces" by A. Z. Petrov, p. 197, 1969) and the joint paper on the fourteen scalar invariants of a general gravitational metric (Proc. Ind. Acad. Sci 29, 91-97, 1949). ⁽⁵⁷⁸⁾

About this time Einstein's new version of a generalised

theory of gravitation was out. Dr Ramji Tiwari examined the nature of interaction between the electromagnetic field and the gravitational. Very lengthy calculations were carried out independently by him and by Professor Narlikar and two papers explaining the character of the interaction came out in 1948 and 1949 in the Proceedings of the N I S I. ^{62, 63, 64} This and the later work done at Banaras on allied topics has been referred to in V. Hlavaty's 'Geometry of Einstein's Unified Field Theory', 1958. Dr Tiwari's Ph. D. thesis later published (1969) by the Banaras Hindu University reports most of the work done later on the same topic.

Dr P C Vaidya had obtained while at Banaras the relativistic solution for a non-static mass (Current Science 12, 183, 1943). A few years later he and Professor Narlikar published some papers jointly on the electromagnetic effects of such fields. Vaidya's solution (1943) has now become famous in general relativity] and much of the later work by Vaidya and his pupils has attracted a very wide attention in important journals. As professor and head of the department of mathematics, Gujarat University, Dr Vaidya had a good team of research workers under his guidance for some years.

After 1950 Dr K P Singh, now Professor of Mathematics at the Banaras Hindu University commenced a

series of joint investigations on the physical significance of several metric invariants. Among the several publications of this period may be mentioned the one on the role of the three - index symbols in general relativity in the Proceedings of the N.I.S.I. (1951) where an analysis is made of the indeterminateness implicit in the co-ordinates of general relativity and a new derivation of the inverse-square law of gravitation is given. He also has had a number of good research students under him. Their work on metrics of gravitational and cosmological significance and on special geometrical features of metrics has attracted wide attention.

While at Banaras Dr B. R. Rao's work for the Ph.D. was on the derivation of the equations of motion from the field equations themselves. [C. Infeld, who was associated with A. Einstein and B. Hoffmann in the classic work on the topic was an examiner of Rao's Ph.D. thesis. He was impressed by the corrections and improvements made by Rao in the method of approximations.]

In a couple of joint papers published in the Proceedings of the N.I.S.I. in 1955 followed by several other papers including the one on the calculations of the motion of the perihelion of Mercury in 1959/ in the same journal, his important results have been reported. The work is referred to in 'Motion and

Relativity' (1960) by L. Infeld and J. Plebanski.

When Professor Narlikar left Banaras in 1960 Dr Swadesh Ranjan Roy, Dr L Radhakrishna, Dr J Krishna Rao, Dr Raghubir Saran had yet to complete their work for the Ph D. Although they continued to receive advice from him they were able to complete their work only with the guidance of Dr P C Vaidya and Dr K P Singh. They have been publishing papers on a variety of topics including gravitational radiation, fields of axial symmetry, gravitational collapse, self-conjugate gravitational fields etc. in Indian and foreign journals.

At the University of Poona, in 1966, Dr A R Prasanna and Dr N Dadhich started their work for the Ph D. In 1972 Mr R S Tikekar and Mr P P Kale have completed their work for the Ph D. These and other investigator at Poona have been interested in problems arising out of the Petrov classification, the equations of motion in general relativity, generalized field equations, spherically symmetric metrics and their curvatures etc. Special mention deserves to be made of Mr M. M. Kumar who has obtained, in a number of papers, interesting properties of conformal metrics and conformally related space-times. The exact references to the publications of most of them will be found in 'Supplement to G R G News Letter No. 11' of the Indian Association for General Relativity and Gravitation.

V.V.N.
21.11.72 "

It will be seen from the note that our research activity was mainly about

- (1) The exact solution of Einstein's equations of General Relativity
- (2) The solutions of unified field equations of Einstein and Schrödinger, separately and in different forms
- (3) The equations of motion as derived from the field equations
- (4) The fourteen scalar differential invariants of the Riemannian metric and their physical significance
- (5) The geometrical and physical properties of metrics satisfying Einstein's field equations.

When I retired from the University of Poona in 1973, many new problems had arisen. It is interesting to see how new techniques have arisen given us a deeper insight into problems which were unknown in the days of Pauli, Einstein and Heisenberg and leading to a new vision of interconnectedness in cosmology and particle physics. It is with deep interest that I watch this interconnectedness, attracting even problems of biology and a mathematician's vision of the fundamental questions of man's role in the universe.

21.1.85

PROGRESS OF MATHEMATICS

Professor V. V. Narlikar

60th birthday
Felicitation Volume

Edited by

R. S. MISHRA

With the Cooperation of

A. Kawaguchi, W. H. McCrea, H. Rund, D. A. Sprott

Volume 3, Nos. 1 and 2, 1969

Published by

THE ACADEMY FOR PROGRESS OF MATHEMATICS

UNIVERSITY OF ALLAHABAD

ALLAHABAD

BANARAS HINDU UNIVERSITY

VARANASI

INDIA

PROFESSOR V. V. NARLIKAR

(A BRIEF BIOGRAPHICAL SKETCH)

Professor Vishnu Vasudev Narlikar was born on 26th September, 1908 at Kolhapur, the capital of the erstwhile princely state in Maharashtra. The family in which he was born was a very devout and religious family. His father was a religious scholar and his sermons on Bhagvat-Puran were heard with rapture by a large audience. This religious strain inherited from the father is very well visible in the character of Professor Narlikar and in his remarkable fondness for reading and studying Sanskrit books and books of other religions as well as books of his own religion.

He had his primary and high school education at Kolhapur. He was a student of the Vidyapith and Rajaram High School where he shone as a very bright boy. He stood 8th in the Matriculation examination (1924) of Bombay University and won the Sir Le Grand Jacob Scholarship. The financial position of his family was poor. However, he was able to pursue higher education with the help of scholarships he won. He went to Bombay in 1924 and joined the Elphinston College and the Royal Institute of Science. His college career was of great distinction. At the B.Sc. Hons. (1928) examination of Bombay University, he stood first class first with record-breaking marks in Mathematics. He went to England in 1928 for higher studies. Financially he got a loan scholarship for this from J. N. Tata Endowment and from Kolhapur state. He was also awarded Sir Mangaldas Nathubhai Travelling Fellowship of the University of Bombay. He joined Fitzwilliam House of Cambridge University, and in 1930 he passed the Tripos in first class and became a B* wrangler. At this examination he stood first in Astronomy and got Tyson medal. ~~He is the first Indian to win this medal.~~ Later he was awarded Sir Isaac Newton Studentship to do research in Astronomy. This studentship was awarded for one year

first and later for three more years. He worked under Sir Joseph Larmor and the eminent astronomer Sir Arthur Eddington, Plumian Professor of Astronomy at Cambridge. In 1932 he was awarded the Raley prize for his valuable researches in Astronomy. He was initiated into astronomical researches by Professor H. F. Baker in the long vacation of 1930.

In 1932 when he was only a young man of twenty four, the late Pandit Madan Mohan Malaviya persuaded him to join Banaras Hindu University as Head of the Department of Mathematics. The University of Bombay honoured him by inviting in 1933 and 1938 to give lectures on relativity. He gave lectures on 'wave mechanics' also in Patna University as Sukhraj Rai Reader in 1930-40. These lectures are published in the form of a book.

He was the President of the Mathematics Section of the Indian Science Congress Association held at Lucknow in 1953. He is a Fellow of the Royal Astronomical Society, London. He is also a Fellow of the Indian National Science Academy, the Indian Academy of Sciences and the National Academy of Sciences. He was the President of the Calcutta Mathematical Society for two years.

He served Banaras Hindu University from 1932 to 1960. During this long period of 28 years he served the University in various capacities. For many years he was a member of the University Court, the Council and the Syndicate. He was the Pro-Vice-Chancellor of Banaras Hindu University. He also served as the Principal of the Central Hindu College.

Professor Narlikar is an eminent authority on relativity theories. He created a research centre in relativity in the Department of Mathematics at Banaras Hindu University at a time when there were not many research workers in India in this new field of Mathematics. His own contributions and the contributions of his co-workers can be classified under two heads—(i) general relativity and cosmology

(ii) unified field theories. He has published more than hundred research papers on these subjects in Indian and foreign journals. Even today when he is over sixty he is actively engaged in research and in the service of mathematical education. Under his able guidance many research workers have obtained Ph.D. degrees and quite a number among them are holding eminent positions both in academic as well as in administrative capacities.

In 1963 he was appointed Emeritus Professor of Mathematics at Banaras Hindu University when he was the Chairman of the Rajasthan State Public Service Commission. He served as Chairman for six years from 1960 to 1966. Afterwards he was invited by Poona University to occupy the LokmanyaTilak Chair of Applied Mathematics. At present he is serving in this capacity guiding research students for the Ph.D. and D.Sc. degrees in relativity, field theories and cosmology.

Anart from being an inspiring teacher, Professor Narlikar is a fine speaker. He has delivered popular lectures in Mathematics and Science in different universities, summer institutes in science, and scientific societies in India. He is an exceedingly well-read man, keenly interested in literature music and sports. Mrs. Narlikar is a Sanskrit scholar, and the elder son Dr Jayant annexed all the coveted prizes at Cambridge which his father won thirty years ago and obtained world-wide fame as the collaborator of Dr. Fred Hoyle in the Hoyle-Narlikar theory of gravitation. The younger son Dr. Anant is a physicist who annexed the Tait prize for natural philosophy at Cambridge.

Professor Narlikar's services to the cause of Mathematical education shall remain a source of great inspiration for the workers in this field.

V.V. NARLIKAR

M.A. (Cantab)

F.R.A.S., F.N.I. F.A.Sc., F.N.A.Sc.

(Emeritus Professor of Mathematics
Banaras Hindu University)

Lokamanya Tilak Professor of
Applied Mathematics (Emeritus)
University of Poona

Indian Academy of Sciences
Letter dated 31 July 1981

701 Colaba Housing Colony,
Homi Bhabha Road

Bombay 400025
7-8-81

Short Biodata (V.V.N.)

1908 Sep. 26 Born at Kolhapur
1928 B.Sc. 1st class first, University of Bombay
1924 Elphinstone College 1925
- 25 and - Royal Institute of Science
Royal Institute of Science 1928
1930 B Star Wrangler Cambridge. Tyson Medallist.
1930 - 32 Isaac Newton Student at Cambridge
working under Sir Joseph Larmor and Sir Arthur Eddington
Rayleigh Prizeman (1932)
1932 - 1960 Professor and Head of the Department of Mathematics, Banaras
Hindu University
1951- 55 Pro Vice-Chancellor
1958 - 60 Principal, Central Hindu College
Chairman, Rajasthan Public Service Commission, Ajmer
1960 - 1966 Lokamanya Tilak Professor of Applied Mathematics
1966 - 1973 Published about a hundred research papers, mainly on General
Relativity and Gravitation
Published a book on Wave Mechanics
Lectured in many universities
Over a dozen students got a doctor's degree at Banaras and Poona

Gujarat University and Banaras Hindu University held 3-day All-India Seminars
in 1968 and 1970. Papers on General Relativity were read and a volume of papers
was presented to V.V.N.

President of the Calcutta Mathematical Society 1958-60. President of the
Mathematics Section, Indian Science Congress (1953).

Since 1973 I have given invited addresses at
the Banaras Hindu University, Indian Association for
the cultivation of Science, Jadavpur (W.B.), Gujarat
University, Shivaji University, Kolhapur, the Tata
Institute of Fundamental Research (Einstein Centenary, 1979) etc.

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तार : नेटसाईस
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Telephone : 331-1865
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भारतीय राष्ट्रीय विज्ञान अकादमी
INDIAN NATIONAL SCIENCE ACADEMY

All communications should be addressed
to the Executive Secretary

Dr M Dhara
Assistant Executive Secretary (Publications)
&
Associate Editor

बहादुरशाह जफर मार्ग
नई दिल्ली-110 002
Bahadur Shah Zafar Marg
New Delhi-110 002
No. Pub/BM/152
the

- 7 MAY 1991

Professor P C Vaidya, FNA
Department of Mathematics
Gujarat University
Ahmedabad-380 009.

Subject: Biographical Memoirs of late Professor V V Narlikar

Dear Sir,

In its endeavour to preserve for posterity the memoirs of the inspiring lives and achievements of scientists, the Indian National Science Academy publishes the Biographical memoirs of its deceased Fellows.

Since we feel that you were intimately connected with him and his scientific career, we take privilege of approaching you for a memoir on him covering broadly the following points:

Full name; Year of Election as F.N.A.; Date and Place of Birth and Death; Marital Status/Number of Children; Fields(s) of Specialization; Highest academic/research degree obtained with the year and name of the University from where awarded; Positions held including last position; Membership of other learned societies; Honours (Awards, prizes with year of award and other details); The family background of the Fellow and a concise account of significant research achievements. A good photograph and a specimen signature of the Fellow are to accompany the memoir alongwith a detailed bibliography of the works of the Fellow arranged chronologically.

The Academy will be happy to provide an honorarium upto Rs.1000/- towards your incidental expenses like visiting various libraries for collecting data, stationery and typing.

I shall be grateful if you will kindly convey your concurrence to undertake the assignment for the best interests of science. Any further clarifications on the subject are welcome.

With best regards,

Yours sincerely

M Dhara

P.S. Prof. J. V. Narlikar FNA suggests your name for this purpose.

Background
1 Family History

2 Date: F.R.A.S.
F.N.A., F.A.S.

3 Photograph with
signature

Professor P. C. Veitch,
Department of Mathematics,
Glasgow University,
Glasgow - 800 009.

Professor V. B. Birkner

DEPARTMENT OF MATHEMATICS

MATHEMATICS

10-5-91

Sci/Math/PCV

To:
Dr. M. Dhara
Assistant Executive Secretary,
Publication
and
Associate Editor,
Indian National Science Academy,
Bahadur Shah Zafar Marg,
NEW DELHI 110 002

Ref:-Your No. Pub/BM/151 dt 7-5-91

Sub:-Biographical Memoirs of Late
Professor V.V. Narlikar.

Dear Dr. Dhara,

I shall gladly undertake to write a memoir
on Late Professor V.V. Narlikar. Will you kindly let me
know if there is a time limit by which the ms. should
reach you? Left to myself, I would take about two
months to prepare the memoir.

With regards,

Yours sincerely,

P.C. Vaidya
(P.C. Vaidya)



INDIAN ACADEMY OF SCIENCES

C.V. RAMAN AVENUE, P.B. NO. 8005, SADASHIVANAGAR,
BANGALORE 560 080, INDIA

Prof. V. Krishnan
Secretary

15 May 1991

Prof. P.C. Vaidya, F.A.Sc.
34, Shardanagar
Ahmedabad 380 007

Dear Prof. Vaidya,

I am indeed thankful to you for your prompt response to my request for an obituary on Prof. V.V. Narlikar. An edited version of this will appear in the next issue of the Newsletter.

I have also passed a copy of the obituary to Prof. S. Ramaseshan to publish it in Current Science.

With best regards,

Yours sincerely,

V. Krishnan

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तार : नेटसाइंस
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Assistant Executive Secretary (Publications)
&
Associate Editor

बहादुरशाह जफर मार्ग
नई दिल्ली-110 002

Bahadur Shah Zafar Marg
New Delhi-110 002

No. PB/91/785

Dated:

17 MAY 1991

Dear Professor Vaidya,

I thank you for your kind letter of May 10, 1991 regarding
the Biographical Memoir on late Professor VV Narlikar.

You may kindly send the memoir as early as possible. I
shall be obliged if you kindly follow our style for
Biographical Memoirs specially for Bibliography.

With warm regards,

Sincerely yours,

Dhara

(M. Dhara)

Professor PC Vaidya, FNA
Department of Mathematics
Gujarat University
Ahmedabad:380009.

Mathematics

11.6.91

Sci/Math/PCV

To:
Dr.M.Dhara,
Assisitant Executive Secretary(Publication),
& Associate Editor,
I.N.S.A.
Bahadur Shah Zafar Marg,
NEW DELHI 110002

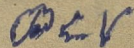
Dear Dr.Dhara,

Thank you for your letter No PB/91/785 dated May 17,1991 .
I am planning to visit Pune during July 13 to 15 to collect some
data for the memoir on Prof.V.V.Narlikar. According to my plan
to send the ms. of the memoir to your office by July 31,

In your letter of 7th May you have mentined about an honorarium
of Rs.1000/- for incidental expenses. Will it possible to send
this amount or a part of this amount in advance ? If yes, please do
so.

With regards,

Yours sincerely,



(P.C.Vaidya)

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&
Associate Editor

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नई दिल्ली-110 002
Bahadur Shah Zafar Marg
New Delhi-110 002

No. Pub/BM/ 1193
the 14th June 1991

18 JUN 1991

Dear Professor Vaidya:

I am writing this to acknowledge with thanks the receipt of your letter No. Sci/Math/PCV dated 11th June 1991 regarding writing of memoir on late Professor V.V. Narlikar and am happy to learn that you will be sending the material by July 31, 1991.

As regards payment of honorarium, as a matter of policy, this is released on completion of the assignment. Inconvenience is regretted.

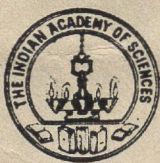
With regards:

Yours sincerely

M. Dhara

(M. Dhara)

Professor P C Vaidya, FNA
Department of Mathematics
School of Sciences
Gujarat University
Ahmedabad



INDIAN ACADEMY OF SCIENCES

C.V. RAMAN AVENUE, P.B. NO. 8005, BANGALORE 560 080, INDIA

G. Madhavan
Executive Secretary

30 September 1994

Prof. P.C. Vaidya, FASc
34, Sharadanagar
Ahmedabad 380 007

Dear Prof. Vaidya,

In connection with the preparation of a database of the past Fellows of the Academy, we have from different sources extracted the enclosed information sheet on Dr/Prof. V.V. Narlikar. As a person familiar with his life and work, we would be grateful if you could go through this data, make any corrections and return it to us in the self-addressed stamped envelope sent herewith.

Would it also be possible for you to let us know from where we can get a copy of his photograph and biodata?

Thanking you for your help in this matter.

Yours sincerely,

G. Madhavan

Univ. of Bombay
Revised

Lokmanya ^{Uttam} Prof. of Applied Maths

1961-73

NARLIKAR, Vishnu Vasudeva (Elected 1935). Born 26 September 1908, Kolhapur, ^{Mathatankra}; Died 1 April 1991; s Vasudevashastri and Kashi-bai Sapre; m. Krishna Huzurbazar; two s. EDUCATION: Univ. of Bombay; BSc (Hons) 28; Univ. of Cambridge: Maths Tripos 30. CAREER: BHU ~~Univ.~~: Prof. and Head of Maths Dept. 32-60, Pro Vice-Chancellor 51-55; Central Hindu College: Principal 58-60; Rajasthan Public Service Commission: Chairman 60-66. President, Calcutta Maths Soc., Indian Maths Soc.,

He established the first formal school of Relativity in India

Unified

Pl. see if you can elaborate it to 150 words.

SCIENTIFIC WORK (Areas of Interest: General Relativity and Field Theories): Narlikar was ^{the} pioneer relativist in India. At BHU his ^{school} group studied exact solutions of Einstein's equations of general relativity, solutions of the unified field equations of Einstein and of Schrodinger, equations of motion as derived from field equations, the fourteen scalar differential invariants of Riemannian metric and their physical significance and the geometrical and physical properties of metrics satisfying Einstein's field equations. PUBLICATIONS:

of Narlikar's work of 14 scalar invariants need special mention.

LASTADD:

including the ^{now well-known} radiating star solution by his student P.C. Vaidya

In 1952 T Y Thomas had proved
 that in a 4-dimensional
 Riemannian manifold only
 14 independent curvature
 invariants ~~exist~~ of second
 order exist. But it was in
 1949 that Nashikar and Karmas-
 kar explicitly constructed
 these 14 invariants. Later

in 1956 Geheman and Debered
 rediscovered this in 1956. ~~as they~~
 # But Geheman ~~no~~ and then ^{when}
 explicit Nashikar's earlier work
 was brought to their notice they
 said these invariants must be
 called Nashikar and Karmaskar invariants

Maths

12-10-94

SciResMath/10

Shri G. Madhavan
Indian Academy of Sciences
CV Raman Ave. P.B. NO. 8005
BANGALORE 560 090

Dear Shri Madhvan,

Please refer to your letter of Sept. 30, 1994. I am enclosing herewith the data base of Prof. V.V. Narlikar in which I have tried to incorporate all your suggestions.

You may please write to his son Prof. J.V. Narlikar, IUCAA Post Bag No. 4, Ganeshkhind, Pune 440007 for a photograph and a copy of biodata of VVN.

With regards,

Yours sincerely,

PCV

(P.C. Vaidya)

NARLIKAR, Vishnu Vasudev (Elected 1935). Born 26 September 1908, Kolhapur- Maharashtra; Died 1 April 1991; s. Vasudeo Shastri and Kashibai Sapre ; m. Krishna Huzurbazar ; two s.

EDUCATION : Univ. of Bombay; B.Sc. (Hons) 28; Uni. of Cambridge; Maths Tripos 30. CAREER : BHU. Prof. and Head of Maths. Dept. 32-60, Pro. Vice Chancellor 51-55; Central Hindu College: Principal 58-60; Rajasthan Public Service Commission :Chairman 60-66;Uni. of Poona : Lokmanya Tilak Prof. of Applied Maths. 66-73. President, Calcutta Maths. Soc., Indian Maths. Soc.

SCIENTIFIC WORK (Areas of Interest : General Relativity & Unified Field Theories) : Narlikar was the pioneer Relativist in India. He established the first formal school of Relativity in the country. At BHU his school studied exact solutions of Einstein's equations of General relativity, including the now well-known radiating star solution by his student P.C.Vaidya ; solutions of the unified field equations of Einstein and Schrödinger, equations of motion as derived from field equations, the fourteen scalar differential invariants of Riemannian metric and their physical significance.

This work on 14 scalar invariants is a very important contribution . In 1922 T.Y.Thomas had proved that in a 4 dimensional Riemannian manifold only 14 independent curvature invariants of ^Δ second order exist. But it was in 1949 that Narlikar and his student Karmarkar explicitly

constructed these 14 invariants. Later in 1956 Geheniau and Debever rediscovered this. When Narlikar's earlier work was brought to their notice they said, these invariants must be called Narlikar and Karmarkar Invariants.

REFERENCE V.V.Narlikar and K.R.Karmarkar :

The Scalar Invariants of General Gravitational Metric.

Proc. Indian Acad. Sc., 29, 91, (1949).

Last Address :

IUCAAA

Post Bag No.4, Ganeshkhind

PUNE 410007