

BRIEF PROFILE OF PROF. (DR.) B.L.RAINA

- ✓ VISIONARY, PROVEN LEADERSHIP, COLLABORATIVE QUALITIES & STRATEGIES
- ✓ INNOVATIVE, RESOURCEFUL & ABLE TO LEAD FROM FRONT TO NEGOCIATE & ARTICULATE A VISION FOR UNIVERSITY PARTNERSHIPS.
- ✓ ON LINE TEACHING & TELEMEDICINE CREDENTIALS OF HIGHEST ORDER

EXPERIENCE (TOTAL: 30+ YRS. IN USA & INDIA)

VC: (7+ Yrs.) Director/ Professor/Research: (14+ Yrs.) Industry: (10 Yrs.)

- ✓ VICE CHANCELLOR, STAREX UNIVERSITY, GURUGRAM, INDIA, UGC approved, August 2020 - Till Date
- ✓ PRO CHANCELLOR, GLOCAL UNIVERSITY, UP, INDIA, UGC approved, May 2019 - till July 2020.
- ✓ VICE CHANCELLOR, GLOCAL UNIVERSITY, UP, INDIA, UGC approved, 2015 - April 2019.
- ✓ VICE CHANCELLOR, SUNRISE UNIVERSITY, Raj. INDIA, UGC approved, 2013 - 2015
- ✓ T.I.F.R (TATA INSTITUTE OF FUNDAMENTAL RESEARCH), Bombay, INDIA; Faculty 1970-76
- ✓ E.C.U, Greenville, NC, USA; (Associate Professor) 1981-87
- ✓ DIVERGENT TECHNOLOGIES, Inc., R.T.P, NC, USA; (C.E.O) 1987-97
- ✓ NATIONAL TECHNOLOGICAL UNIVERSITY, India, ITP Campus; (Dir.) 2003-08
- ✓ GITM GROUP OF ENGINEERING COLLEGES , (GCEW), HRY; (Director) 2009-13

PRESTIGIOUS FELLOWSHIPS/AWARDS & WHO'S WHO NOMINATIONS

- Fellowship: T.I.F.R (Bombay, India)
- Best Researcher of the year 1994 in RTP, USA
- Fellowship: FULBRIGHT
- Fellowship: SATHNA TRUST (Bombay, India)
- Fellowship: INDIA FOUNDATION (Bombay, India)
- Who's Who: ASIA/Pacific, (XI edition, February 2012, page 316)
- LIFE-TIME ACHIEVEMENT AWARD given by NICER (Dec. 2016)
- BEST TECHNOLOGIST/SCIENTIST OF THE YEAR 2018 AWARD given by worldwide achievement.
- BEST CITIZEN OF INDIA AWARD 2020 Given by "International publishing House"

BACKGROUND

Backed by an exceptionally brilliant academic record, Prof. Raina has been engaged in administration, teaching & research for nearly 35 years now. He was awarded prestigious national fellowship of "TATA INSTITUTE OF FUNDAMENTAL RESEARCH" (T.I.F.R), Bombay, INDIA wherein he spent four years of research work and then proceeded to USA on an International fellowship to obtain his M.Tech (Computer Science Engineering & PhD from 'USC', USA.

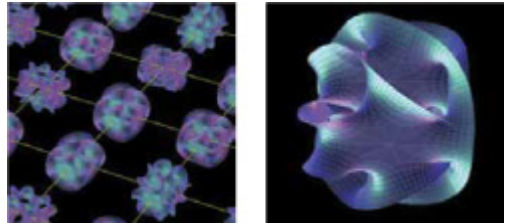
Did he not only write an exemplary research paper at an early age of his career of 10+2 standard published by reputed 'American Mathematical Society' (January 1969 page 48-51), but his paper (part of which is noted below just for reference) was also widely acclaimed and often cited (e.g., See A. Del Cintel, 2008-SPRINGER) which in a dramatic development helped various eminent Scientists like Prof. ANDRE WILE then at PRINCETON UNIVERSITY, to draw a vital connection between the ELLIPTIC CURVES and MODULAR FORM (See Ribet: Tanahama-Shimura Conjecture, 1986) leading him eventually to the famous solution in 1995 of even more famous CONJECTURE (See Annals of Mathematics, 142 (1995), which was unsolved for the last 350 years, earned Prof. Wiles a well-deserved 'KNIGHT HOOD' & the most prestigious award of 'FIELDS MEDAL'. Dr. Raina's above cited results have also immensely helped in the development of many subjects and more recently in 'CALABI-YAU' spaces & 'STRING Theory' in ASTRONOMY, thereby unifying the theories of 'NEWTON'S Gravitation, QUANTUM Physics & EINSTEIN'S Relativity.

PRESENT RESEARCH INTEREST

Summary: Computer visualization for the value $p=5$ in FLT above gives rise to a manifold called "Calabi-Yau" space having ten dimensions with vanishing RACCI Tensor and with well-known Topology and Algebraic equations. While Dr. Witten received Nobel Prize for modifying String theory, Dr. Yau at Harvard got Nobel Prize for proving the existence of a Metric on the Calabi-Yau space which is exactly the Einstein's metric. My present research interest is to describe this metric and if successful, it will have enormous implications in String Theory of ASTRONOMY and in unifying the general theory of relativity with that of QUANTUM Laws of Physics. Should this task be successful, it will also prove that there are not only four but eleven dimensions and, possibly many universes;

CALABI-YAU SPACE---(Fermat Theorem Images)

Calabi-Yau spaces are important in string theory, where one model posits the geometry of the universe to consist of a ten-dimensional space of the form $M^4 \times Y^6$, where M^4 is a four-dimensional manifold (space-time) and Y^6 is a six-dimensional compact Calabi-Yau space. String Theory predicts the existence of more than the 3 space dimensions and 1 time dimension we are all familiar with. According to string



theory, there are additional dimensions that we are unfamiliar with because they are curled up into tiny complicated shapes that can only be seen on tiny scales. If we could shrink to this tiny, Planck-sized scale we could see that at every 3D point in space, we can also explore 6 additional dimensions. This animation shows an array of Calabi-Yau spaces which are projections of these higher dimensions into the more familiar dimensions we are aware of

For more information, please find the following links:

1. String Theory.mp4
2. Calabi.mp4
3. Calabi Space Explained.mp4
4. Calabi.mp4
5. Calabi.mp4
6. Calabi Space Explained.mp4
7. 4th Dimension Explained
8. String Theory.mp4
9. String Theory.mp4
10. Part 01_String Theory

In USA, Prof. Raina taught for more than 15 years at various Universities including Duke, 'UNC' education system; & 'E.C.U' in Greenville, North Carolina, USA etc. During his entire stay of more than 27 years in the US, Dr. Raina has obtained many grants/projects/ consultancies and awards from various agencies some of which are noted below:

Organization	Project	Year
National Semiconductors (NSC) Santa Clara, CA, USA	Technology Transfer (Know- how) along with PG-tapes of high speed C-MOS Technology Process of NSC, USA (after add-on value i.e., increased yield) to several International Companies including 'Semi- conductor Complex Limited' (SCL) Mohali Chandigarh, India	1990-91
BRITISH TELECOM, UK (Now NORTEL)	To decrease the Bandwidth requirement for full motion video (M-Peg standard)	1995-96
UNC at Chapel Hill Research Triangle Park, USA	To develop teleconferencing system (Hardware & Software) using ISDN	1997-98
UNIVERSITY OF FLORIDA, Gainesville FL, USA	To Develop & install Telemedicine/distance learning connecting all the 25 prisons of North Carolina, USA	1998-99
IBM, Research triangle Park, NC USA	To Develop Distance Learning Hardware cum Software using compression decompression techniques.	1999-00
AT&T, USA	TO develop distance learning hardware/software using compression/decompression techniques.	2000-01

Publications:

Member of the advisory board for the following institutions

1. MRK Institute of Engineering & Technology, Rewari, HRY
2. Indo-Canadian Educational society, CANADA
3. De Montfort University, Leicester, UK
4. INTERNATIONAL JOURNAL OF RESEARCH CULTURE SOCIETY
5. AAHPL (HEALTH CARE) PVT. LIMITED, "OMED Dr."

During his tenure as C.E.O of "Divergent Technologies, Inc.", NC, USA, Dr. Raina is transfers (in collaboration with National Semiconductors at Santa Clara) of "High Speed C-MOS" (process) devices like '74HC74' to several companies in different countries including SCL- 'Semi Conductor Complex Ltd.', Mohali, Chandigarh, India. While Dr. Raina was declared the best researcher in 'Research Triangle Park', USA in 1994, he was also awarded many prestigious awards and was adjudged & published as "WHO'S WHO" in many publications & journals, the most recent being 'Asia/Pacific' (XI edition, February 2012, page 316) and in 'Reguerdon Inc.'-ACHIEVERS INDIA-NATION'S WHO'S WHO (May 2012 edition)

RECENT ACOMPLISHMENTS

1. Was declared as 'The best researcher/administrator' in RTP, USA 1994
2. Wrote recently a high quality research paper in STRING THEORY which, if approved, has the potential to change the concept of universe.
3. Obtained two foreign University collaborations from USA and UK.
4. Have successfully obtained approvals of three UGC visits for (2f), 12(B) during the months of May & Aug 2015 and Sept. 2017 respectively for the above Universities.
5. Made certain fundamental changes in teaching methodologies which not only improved the results substantially but has put University uniquely at a strategic advantage.
6. 'Reguerdon Inc.' ACHIEVERS INDIA-NATION'S WHO'S WHO (2012)
7. Made technology transfers (in collaboration with National Semiconductors at Santa Clara, USA) of "High Speed C-MOS" (process) devices like '74HC74' to several companies in different countries including SCL- 'Semi Conductor Complex Ltd.' Mohali, Chandigarh, India.

✓ **Following images pertain to the snaps shots of my "patents"**

✓ **First page of my first research paper written while I was an undergraduate**

✓ **WHO'S WHO" & "Newspaper clips"**

PATENTS (1 OF 3)

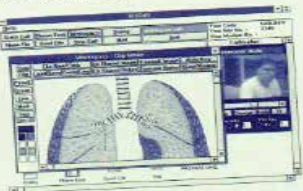


PATENTS (2 OF 3)

Synapse
DIGITAL TECHNOLOGIES, INC.

VideoLink Video Conferencing System for PCs

VideoLink is a low cost PC based video conferencing system that allows two remote sites to exchange video and data over a single standard (POTS) telephone line. The whiteboard feature allows for filing users to collaborate on documents. VideoLink also supports file and image transfer and an interactive chat utility.



A complete package includes a digital video camera with a built-in microphone for video and voice capture. It also has a single board with a digitizer, sound processor and a codec. VideoLink can also operate without any special video capture hardware. In this mode of operation, a site can display incoming video images although it cannot transmit video to other sites. All the other features remain fully operational in this mode. This software-only solution is cost effective in situations where only one way video transmission is needed.

VideoLink offers point solutions to a wide variety of applications ranging from remote training and learning to conducting business meetings remotely, thereby saving time and cost of travel. Remote surveillance, remote product support, remote consultation and telemedicine are some of the applications that VideoLink supports very efficiently.

VideoLink features

- Low cost
- Easy to install and use
- Interactive document sharing
- Video transfer at 7 fps
- Support for two remotely selectable video sources
- DCT software video compression
- Auto answering of incoming calls
- Online easy-to-use phone book
- File transfer
- Interactive chat utility

2525 Meridian Parkway, Suite 50 • Durham NC 27713 • USA
Telephone: 919 544 5888 • Fax: 919 544 8970

PATENTS (3 OF 3)


Synapse
DIGITAL TECHNOLOGIES, INC.

VC 7000 Video Conferencing System

VC 7000 is a self contained video conferencing system. Operating on the ISDN basic rate interface and Switched 56 networks, the system provides high quality, high speed live video and audio. VC 7000 can support a broad range of auxiliary devices such as additional cameras, dual video converters, document scanners, overflow monitors, and PCs, augmenting communications and making it more than just a videophone.

VC 7000 can virtually transport the patient for a consultation with an expert radiologist or pathologist.

VC 7000 can also be used to conduct remote meetings and remote banking sessions involving a large number of people. Everyone in the meeting becomes an active participant with the use of additional cameras and microphones. Even a personal computer may be attached for displaying the latest sales figures on a spreadsheet or a graphics package. Engineers at different locations can work on a design together using CAD packages installed on the PC.



VC 7000 features

- ISDN and Switched 56 interface
- Nine inch NTSC color monitor
- Single chip CCD color camera
- H.261 compliant video communication
- G.711/G.722/G.728 compliant audio communication
- RS-232 interface for auxiliary devices
- Video up to 30 fps
- Up to 352x288 picture resolution

VC 7000 finds applications in several areas. In telemedicine, VC 7000 can provide the same high quality health care to remote regions as that available at large medical centers. Film scanners, computers, and microscopes interfaced to VC

2525 Meridian Parkway, Suite 50 • Durham NC 27713 • USA
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First page of my research paper written while an undergraduate

1969] MATHEMATICAL NOTES 49

2. J. Nagura, On the interval containing at least one prime number, Proc. Japan Acad., 28 (1952) 177-181.
3. S. Pillai, On m consecutive integers, Proc. Indian Acad. Sci., Sect. A, 11 (1940) 6-12.

ON FERMAT'S LAST THEOREM
BANSI LAL RAINA, J and K University, Srinagar, Kashmir (India)

In this note we shall prove two theorems pertaining to Fermat's last theorem, which shall be referred to as FLT.

THEOREM 1. If $p \neq 3$ and is an odd prime and

(1)
$$x^{p-1} + y^{p-1} = z^{p-1}$$

holds with positive, pairwise prime integers, then z is a quadratic residue mod p . For $p = 3$ the statement is false.

Proof. Assume that $(xyz, p) = 1$; then by Fermat's theorem we have

(2)
$$x^{p-1} \equiv y^{p-1} \equiv z^{p-1} \equiv 1 \pmod{p}.$$

From (1) and (2) we get $2 \equiv 1 \pmod{p}$ which is impossible. Thus, since the integers x, y, z are pairwise prime, exactly one of them must be divisible by p . Suppose $p | z$; then from (1) and (2) we have $2 \equiv 0 \pmod{p}$. Hence z must be coprime to p ; also either of x and y must be divisible by p and the other one must be coprime to it.

If x and y are both odd, $x^{p-1} + y^{p-1} \equiv 2 \not\equiv z^{p-1} \pmod{4}$. Hence z must be odd and, of x and y , one must be odd and the other even.

Let us consider that x is odd and is divisible by p , so that y is even and coprime to p .

Rewriting (1) as

(3)
$$x^{p-1} = (z^{(p-1)/2} - y^{(p-1)/2})(z^{(p-1)/2} + y^{(p-1)/2}),$$

since x is odd and z prime to y , the two factors on the right hand side of (3) must be coprime and thus each must be a perfect $(p-1)$ th power. Hence

(4)
$$\begin{cases} z^{(p-1)/2} + y^{(p-1)/2} = a^{p-1} & (a) \\ z^{(p-1)/2} - y^{(p-1)/2} = b^{p-1} & (b) \end{cases}$$

where $x = ab$.

Adding (4a) and (4b) we get

(5)
$$2z^{(p-1)/2} = a^{p-1} + b^{p-1}.$$

Since $p | x$ and $(a, b) = 1$, one of a and b is divisible by p and the other coprime to it. Thus from (5) we have

$$2z^{(p-1)/2} \equiv 1 \pmod{p}.$$

(Written while studying for 10+2)