Dr. V. Chandrasekar

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Professional Interests

(i) Radar Systems and Networking, (ii) Radar Meteorology, (iii) RF Communication Systems, (iv) Signal Processing

Education

1986 Ph.D., Electrical Engineering, Colorado State University
1983 M.S., Electrical Engineering, Colorado State University
1981 B.Tech., Electrical Engineering, IIT Kharagpur,India

Professional Experience

2014- Current University Distinguished professor
1998- Current Professor, Colorado State University
1993-1998 Associate professor, Colorado State University
1990-1993 Assistant professor, Colorado State University
1989-1990 Assistant Professor, UAH
1986-1989 Research Assistant Professor, Colorado State University
1982-1986 Research Assistant, Colorado State University (with assignments at NCAR and National Bureau of Standards, currently NIST)

Awards and Recognition:

1. Knighted by the Government of Finland
2. Elected Fellow IEEE, AMS
3. Affiliate Scientist NASA/ JPL, 2015-current, and NCAR 2008—2014.
4. Elected Chair of Union of Radio Science International (URSI) Commission F, National Academy; 2012-2015
5. Distinguished professor of Finland, 2010-2016, IITM Pune
6. Oliver Pennok Distinguished Service Award, 2010
7. IEEE Education award, 2009
8. Preston Davis Award for Instructional innovation, 2009
9. NWS/ NOAA Director's Medal of Excellence, 2007
10. NASA Goddard Space Flight Center Distinguished Visiting Scientist, 2002
11. NASA Technical Innovation Award, 2002
12. Abell Award for International Research and Development Contribution, 2008
13. Abell Outstanding Researcher Award, 2001, 2006
14. President Sigma Xi Scientific Research Honor Society, 2002
15. Jack E. Cermak Outstanding Advisor Award, 2001
16. Distinguished Diversity services Award, 1999
17. Dean's Council Award for Excellence in Teaching and Research, 1996
18. Halliburton Foundation Young faculty Research Excellence Award, 1993
19. Telecommunication Research Institute of Ontario Certificate of Recognition (TRIO), 1991
20. Member, National Academy of Sciences panel on **Future generation weather radars.**
21. Member, National Academy of Sciences panel on **Radar based Flash Flood Forecasting.**
22. Member, National Academy of Sciences panel on **Feasibility of Extending TRMM Mission**.
23. Member of Science Team, NASA GPM mission
24. Patents awarded: **15 patents, all licensed by industry**

Research Books Authored

- Introduction to Probability and Random Processes, McGraw-Hill, 1997, ISBN 0-07-001563-5.
- Polarimetric Doppler Weather Radar, Cambridge University Press, 2000, ISBN 0-521-62384-7
- Weather Radar Technology beyond NEXRAD, Academies Press, 2002, ISBN 0-309-08466-0
- Flash Flood Forecasting Over Complex Terrain, Academies Press, 2004, ISBN 0-309-09316-3
- Assessment on the Benefits of Extending the Tropical rainfall Measuring Mission, 2006, ISBN 0-309-10282-0
- NOAA's role in Space Based Global Precipitation Estimation and Application, Academy Press, ISBN: 10-0-309-10298-7.
- Observing Weather and Climate from the Ground UP, A Nationwide Network of Networks, National Academy Press, ISBN: 13 978-0-309-12986-2.

Academic Supervision and Mentoring:

- Receipient of Cermack Outstanding Advisor award
- **PhD Supervision**: PhD Supervisor for 35 scholars.
- **Master of Sceince Supervision**: MS Supervisor for 40 scholars.
- **Supervision of** Post Doctoral Fellows / Research Associates/ Research Scientists Mentored: A total of 18 post doctoral level scientists mentores in the lab.

Pedagogical training and curricular excellence:

Was a pioneer in innovation of radar education for distance learning prepared the Virtual radar system for research and educational purpose both nationally and internationally. Received two major awards to recognize the innovation in education pedagogical competence namely

a) IEEE Education award, 2009

b) Preston Davis Award for Instructional innovation, 2009

Involvement in curriculum planning and the implementation of courses:

Extensively involved in preparing new courses in the program, on

a) Radar systems,
b) Advanced concepts in electromagnetics and Meteorological Radar Systems
c) Polarimetry
d) Distance education packages for Digital Signal processing and Radar Systems
e) Short Course Offerings at professional conferences namely, US, European and Asian Conferences on radar science, radar meteorology and remote sensing

Long term Contribution to Science, Engineering, Economy and impact

1. **Significant Science and Engineering Contributions *Distinguished professor of Finland*** (with *an award amount of 1 Million Euro*). This award is a culmination of recognition for international scientific accomplishments. This award is made by the Government of Finland under the Umbrella of Finnish Innovation Foundation. Considered as one of the most prestigious award in European Scientific Circles. With this title comes Honorary

Distinguished Professor appointment in University of Finland, Finnish meteorological Institute and Technical Universities.

2. ***National Academy Recognition***: Was selected by the National Academy to serve on six committees that laid the policy frame work, for future technologies and critical decisions in radar systems, remote sensing programs as well as decisions about extending space missions. Co-authored policy book directives that laid the foundations for investment in science and technologies in meteorological observation systems.

3. **2005-current**; **Urban Monitoring Networks:** Developed the vision/concept of urban monitoring radar networks. The current paradigms of using the large radar are not sustainable from sociological and economic perspective in urban areas. Developing the concept of urban monitoring networks for " muti-use ", covering the sectors of 1) Urban Flood Forecasting, 2) Transportation , 3) Department of Homeland Security and 4) Severe Weather (Tornado) warning 5) Air space surveillance . This concept has taken hold nationally and internationally. Currently leading a ***"National Demonstration Project***" to build an 8 radar network for the City of Dallas Fort Worth. Partnering in similar networks in Japan (Tokyo, Osaka, Kyoto etc. ..), as well as new initiatives in Europe (Rotterdam, London , Paris) and Asia (Shanghai, Beijing and Mumbai).

4. **2000- Current, Formation of the CASA ERC**: Developed the national networked small radar concept. First wrote a concept paper, travelled the country forming partnerships, making presentations, to agencies and scientific community, nationwide and internationally, ***organized meetings for the National Academy*** in Fort Collins, to solidify the concept, , formed formal partnership with UMASS, OU and UPRM, and Government laboratories and saw it to completion of an establishment of an Engineering Research Center. The effort totaled to a $ 40 million program.

5. **1980- Current;** Dual**-Polarization Weather Radar:** Championed for nationwide deployment of Dual-polarization Radar in public and private sectors (over 3 decades). This was the tough challenge, to change status-quo. Demonstrated the scientific advantage of dual polarization for meteorological applications, conducted critical experiments at National Center for Atmospheric Research, with the CP-2 radar in the 1980s then joined the CSU-CHILL team, and subsequently, worked with NOAA/ National Severe Strom Laboratory Today there is a large billion dollar , dual polarized Weather Service Radar Program with over 150 radars deployed nationwide and an additional 150 in Europe and Asia. Played a critical role, as interface mediator between private sector and government. The efforts for introducing dual-polarization into the broadcast private sector are well known through the broadcast meteorology community. There are about 15 dual-pol radars in the broadcast market. In summary, this effort has contributed to both scientific progress, as well as economic development.

6. **1995- Current; Industrial Impact:** Worked with private industry to supply the dual-pol systems and products to develop a market. Honored with the title ***Vaisala Distinguished Fellow*** for this effort.

7. **1995- Current; Educational Excellence:** Outreach and educational leadership, through the development of the VCHILL Concept (Virtual radar). The VCHILL vision, which was far ahead of its time, those days, and the concept is institutionalized now. Was awarded the ***IEEE education award and CSU Provost Award for Instructional Innovation for this effort.***

8. **1998- Current; Space Borne Weather Radar**: Global Precipitation measurements using space borne radars: Developed advanced retrieval systems that are meant for retrieving global precipitation and microphysics from space borne radars, which is a core part of NASA missions. Currently serve as mission team member with "critical role in space borne radar algorithms". Was also selected to the science team of French / India Mission called Megha Tropiques. I was honored with a ***Distinguished Visiting Scientist Title by NASA Goddard Space Flight Center (2003-2004***) , and ***Distinguished Visiting Professor of Indian institute of tropical Meteorology*** (2010- current) for this effort.

9. **1995- Current; Contributions to Biomedical Engineering**: Was the leader instrumental is developing the "Esophageal Impedance Detection System ", for Gastro Intestinal reflux detection. This was granted FDA approval and is a "gold standard "today by gastroenterologists to determine the suitability of patients for surgery.

10. **1981- current; Unique Contribution both basic sciences and Engineering**: Honor of elevation to Fellow status by two completely different professional societies, namely American Meteorological Society (AMS, for Scientific Contributions) and IEEE (Electrical Engineering professional society, for engineering contributions).

FIVE Recent Publications

Journal Publications: **Author of 215 Journal Articles**, **H index: 48**
Conference Publications: Author of about 540 Conference Papers

1. Lee, P., A. P. Jayasumana, H.M.N. Dilum Bandara, S. Lim, **V. Chandrasekar:** A peer-to-peer collaboration framework for multi-sensor data fusion, ***J. Net. Comp. Appli***. 35, 1052–1066, 2012
2. Ruzanski, E. and **V. Chandrasekar:** Improved liquid water equivalent nowcasting using the Weather Support to Deicing Decision Making system, J***. Atmos. Oceanic Technol.***, 29, 407–416, 2012
3. Bharadwaj, N. and **V. Chandrasekar**, Wideband Waveform Design Principles for Solid-state Weather Radars***, J. Atmos. Oceanic Technol.***, 29, 14–31, 2012
4. Le, M. and **V. Chandrasekar**: Raindrop, Size Distribution Retrieval from Dual-Frequency and Dual-Polarization Radar***, IEEE Trans. Geoscie. Remot. Sens.***, 99, 1-11, 2011
5. Leinonen, J., D. Moisseev, V. Chandrasekar, J. Koskinen: Mapping Radar Reflectivity Values of Snowfall between Frequency Bands, ***IEEE Trans. Geosci. Remot. Sens.*** IEEE Transactions, 49, 3047-3058, 2011