

Venkata Amarnadh Surapaneni

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EDUCATION

- Ph.D. in Plant Biomechanics**, grade: 1.0/1.0[§], *magna cum laude* 2017–2021
University of Freiburg, Freiburg im Breisgau, Germany
Thesis: Ontogeny and morphology of plant cuticular ridges, and their effect on insect adhesion and friction: experiments, theory and biomimetics
Advisor: Prof. Thomas Speck
- M.Tech in Nanotechnology**, grade: 8.36/10[§] 2012–2014
National Institute of Technology Karnataka, Surathkal, India
- B.Tech in Mechanical Engineering**, grade: 79.45/100[§] 2005–2009
Acharya Nagarjuna University, Guntur, India

RESEARCH INTERESTS

Experimental micro- and nanomechanics of biological and bioinspired materials

RESEARCH EXPERIENCE

- Visiting Academic**, Experimental flow testing and visualization of fish filter structures 2024
Trinity College Dublin, Dublin, Ireland
- Postdoc**, Mechanics of biological materials and ultrastructures 2022–2024
City University of Hong Kong, Kowloon, Hong Kong
- Postdoc**, Nanostructure and mechanics of color in stingray skin 2021
Max Planck Institute of Colloids and Interfaces, Potsdam, Germany
- Research Fellow**, Fracture and fatigue in nanocrystalline materials for MEMS/NEMS 2010–2011
Indian Institute of Technology Bombay, Mumbai, India

TEACHING EXPERIENCE

- Assistant Professor**, Department of Mechanical Engineering 2015–2017
VNR Vignana Jyothi Institute of Engineering and Technology, Hyderabad, India
- Assistant Professor**, Department of Mechanical Engineering 2014–2015
Mahatma Gandhi Institute of Technology, Hyderabad, India
- Lecturer**, Department of Mechanical Engineering 2009–2010
Bapatla Engineering College, Bapatla, India

Subjects taught: Engineering Drawing, Engineering Mechanics, Mechanics of Materials

INDUSTRIAL PROJECTS AND TRAINING

Industrial secondment, Bioinspired surfaces for household technical products 2019
EGO Elektro Gerätebau GmbH, Oberderdingen, Germany

Training, Mechanical CADD 2009
MSME-Tool room, Central Institute of Tool Design, Hyderabad, India

SELECTED PUBLICATIONS § shared first author, * corresponding author

Surapaneni VA*, Flaum B, Schindler M, Hayat K, Wölfer J, Baum D, Hu R, Kong TF, Doube M, Dean MN* (2024) The helmeted hornbill casque is reinforced by a bundle of exceptionally thick, rod-like trabeculae. *Annals of the New York Academy of Sciences*. Accepted (*Invited*)

Surapaneni VA*§, Blumer MJ§, Tadayon K, McIvor AJ, Redl S, Honis HR, Mollen FH, Amini S, Dean MN* (2024) Ribbontail stingray skin employs a core-shell photonic glass ultrastructure to make blue structural color. *Advanced Optical Materials*, 2301909. doi: 10.1002/adom.202301909

Surapaneni VA*, Schindler M, de Faria L, Ziege R, Bidan C, Mollen F, Amini S, Hanna S, Dean M* (2022) Groovy and gnarly: Surface wrinkles as a multifunctional motif for terrestrial and marine environments. *Integrative and Comparative Biology*, 62:749-761. doi: 10.1093/icb/icac079 (*Invited*)

Surapaneni VA*, Aust T, Speck T, Thielen M (2021) Polarity in cuticular ridge development and insect attachment on leaf surfaces of *Schismatoglottis calypttrata*. *Beilstein Journal of Nanotechnology*, 12, 1326-1338. doi: 10.3762/bjnano.12.98

Surapaneni VA*, Bold G, Speck T, Thielen M (2020) Spatiotemporal development of cuticular ridges on leaf surfaces of *Hevea brasiliensis* alters insect attachment. *Royal Society Open Science*, 7:201319. doi: 10.1098/rsos.201319

Bergmann JB, Maotsou D*, **Surapaneni VA**, Thielen M, Speck T, Wilts BD*, Steiner U* (2020) Polymerization-induced wrinkled surfaces with controlled topography as slippery surfaces for Colorado potato beetles. *Advanced Materials Interfaces*, 7:2000129. doi: 10.1002/admi.202000129

Kumar C§, Palacios A§, **Surapaneni VA**, Bold G, Thielen M, Licht E, Higham TE, Speck T*, Le Houérou V (2018) Replicating the complexity of natural surfaces: technique validation and applications for biomimetics, ecology and evolution. *Philosophical Transactions of the Royal Society A*, 377:20180265. doi: 10.1098/rsta.2018.0265

PUBLISHED PATENTS

Kaviti AK, Akkala SR, Pasula N, **Surapaneni VA** (2022) Submerged nanoporous micro hotspot structure for solar desalination and method of preparation. Patent Office Chennai, India, application no.: 202241003900

Surapaneni VA (2019) A method to create robust superhydrophobic/self-cleaning surface. Patent Office Chennai, India, application no.: 201841003238

SELECTED TALKS * presenting author

Surapaneni VA*, MN Dean* (2024) Fluid mechanics of filter feeding in basking sharks. Trinity College Dublin, Dublin, Ireland. May 29 (*Invited*)

Surapaneni VA*, MN Dean* (2023) Multidisciplinary filter science: Current trends and future directions. *Filters in Biology & Biomimetics (FiBB)*, Berlin, Germany. May 15–16

Surapaneni VA*, Wölfer J, Schindler M, de Faria L, Mollen F, Amini S, Hanna S, Dean M (2022) Ecomorphology of multifunctional wrinkles across terrestrial and aquatic organisms - a source of inspiration for functional biomimetic surfaces. *SEB Conference*, Montpellier, France. Jul 5–8

Surapaneni VA*, Schindler M, de Faria L, Ziege R, Bidan C, Mollen F, Amini S, Hanna S, Dean MN (2022) Groovy and gnarly: Surface wrinkles as a multifunctional motif for terrestrial and marine environments. *SICB Annual Meeting*, Phoenix, USA. Jan 3–7 (*Invited*)

Surapaneni VA* (2022) Biological and bioinspired materials: an interdisciplinary approach for nature-inspired innovation. VNR Vignana Jyothi Institute of Engineering and Technology, Hyderabad, India. Dec 1 (*Invited*)

Surapaneni VA*, Bold G, Thielen M, Speck T (2019) Microstructural morphology of plant surfaces and bioinspiration. *PlaMatSu Annual Meeting*, University of Cambridge, Cambridge, UK, Sep 9–19

Surapaneni VA*, Bold G, Thielen M, Speck T (2019) Plant surface microstructures - insect adhesion and biomimetics, *EUROMAT*, Stockholm, Sweden. Sep 1–5

Surapaneni VA*, Bold G, Thielen M, Speck T (2018) Ontogenetic variations of plant surface microstructures and insect adhesion. *International Plant Biomechanics Conference*, Montreal, Canada. Aug 9–14

AWARDS AND RECOGNITIONS

Visiting scientist – Invitation to attend ‘72nd Lindau Nobel Laureate Meeting’ Council for the Lindau Nobel Laureate Meetings, Germany (also conferred the title ‘Lindau Alumni’)	2023
Honor magna cum laude – for excellence in doctoral studies University of Freiburg, Freiburg im Breisgau, Germany	2021
First prize – ‘Momento-Critico’, a national-level competition on truss mechanics Jawaharlal Nehru Technological University, Hyderabad, India	2007
Certificate of merit – ‘Nocturnal Machines’, a national-level competition on linkages Jawaharlal Nehru Technological University, Hyderabad, India	2007
Third rank – II year B.Tech Mechanical Engineering Bapatla Engineering College, Bapatla, India	2007
First prize – Technical quiz, a college-level competition on engineering basics Bapatla Engineering College, Bapatla, India	2006
Second rank – I year B.Tech Mechanical Engineering Bapatla Engineering College, Bapatla, India	2006

GRANTS AND FUNDING

Research grant to study flow mechanics of fish filter feeding at Trinity College Dublin ~635240 INR from Fisheries Society of the British Isles, UK (ongoing)	2023
Financial support to attend the '72nd Lindau Nobel Laureate Meeting', Germany ~449450 INR from Council for the Lindau Nobel Laureate Meetings, Germany and Croucher Foundation, Hong Kong	2023
Funding for organizing 'Filters in Biology+Biomimetics' conference, Germany ~11977580 INR from Matters of Activity, Germany; Carl Gans Fund, USA; Fisheries Society of the British Isles, UK; Society for the Study of Evolution, USA; Company of Biologists, UK and Society for Integrative and Comparative Biology, USA	2023
Broadening participation professional development award ~41460 INR from SICB 2023 Annual Meeting, Austin, USA	2023
Travel & registration grant: mechanical ecology-taking biomechanics to the field ~134850 INR from SEB Annual Conference, Montpellier, France	2022

FELLOWSHIPS

Marie Skłodowska Curie Early-Stage Researcher Fellowship ~13934380 INR from EU Horizon 2020 for PhD studies at University of Freiburg, Freiburg, Germany (also conferred the title 'Marie Curie Alumni')	2017–2020
MHRD India Fellowship for master studies ~192000 INR for master studies at National Institute of Technology Karnataka, Surathkal, India	2012–2014

PROFESSIONAL ACTIVITIES AND OUTREACH

Educational Council member The Society for Integrative and Comparative Biology (SICB), USA	2023–2026
Organizer, first international 'Filters in Biology+Biomimetics' conference Matters of Activity - Image Space Material, Berlin, Germany. May 15–16	2023
Gans award committee (GAC) member, Division of Comparative Biomechanics The Society for Integrative and Comparative Biology (SICB), USA	2023
Editorial reviewer Integrative and Comparative Biology journal	2022–2023
Reviewer for the journals: Acta Biomaterialia, Royal Society Open Science, Bioinspiration and Biomimetics, Biomedical Materials, Beilstein Journal of Nanotechnology, Applied Physics A and Surface Topography: Metrology and Properties	2020–2024
Coordinating member, 'Our Future Is Nature Inspired', a public outreach exhibition Cambridge University Botanic Garden, Cambridge, UK. Sep–Nov	2020

Scientific outreach through Wikimedia projects: popularization of bio-inspired materials on Wikipedia. Adolphe Merkle Institute. Fribourg, Switzerland. Sep 25–26	2018
Coordinator, workshop on 'Advanced Engineering Materials and Applications' VNR Vignana Jyothi Institute of Engineering and Technology, Hyderabad, India. Jan 31	2017
Coordinator, 'Open House 2k17', a student project exhibition VNR Vignana Jyothi Institute of Engineering and Technology, Hyderabad, India	2017
Organizer, MechElements - BECTAGON' 07; a national-level technical symposium Bapatla Engineering College, Bapatla, India	2007

OTHER SELECTED PARTICIPATION

Opening open science to elderly worldwide – 3rd Lindau online sciathon Lindau Nobel Laureate Meetings. Lindau, Germany. Apr 28–30	2023
Workshops on 'Introduction to R&D in industry' and 'Public outreach' University of Cambridge, Cambridge, UK. Sep 10–19	2019
Training workshops on scientific writing and presentation skills ESR Weekend, Paris, France. Jul 18–21	2019
Living Light conference University of Cambridge, Cambridge, UK. Apr 10–14	2018
Winter school – ITN PlaMatSu & NCCR Bio-inspired materials St. Moritz, Switzerland. Jan 28–Feb 3	2018
International workshop on 'Adhesion and friction: simulation, experiment, applications' TU Berlin, Berlin, Germany. Nov 13–16	2017
Workshop on 'Ethical challenges for young scientists' Adolphe Merkle Institute, Fribourg, Switzerland. Sep 29	2017
Workshop on 'Technology transfer and innovation' Adolphe Merkle Institute, Fribourg, Switzerland. Sep 28	2017
EU H2020 ITN PlaMatSu: PhD Student Participation – Outreach on YouTube Adolphe Merkle Institute, Fribourg, Switzerland. Sep 28	2017
Workshop on 'Teaching and evaluating for the 21st century' IIT Hyderabad Teaching Learning Center, VNR VJIET, Hyderabad, India. May 18-19	2016
Summer fellowship – Synthesis and characterization of TiO ₂ -graphene composites Indian Institute of Technology Madras, Chennai, India	2013

MEMBERSHIPS

Society for Experimental Biology (SEB)
Society for Integrative and Comparative Biology (SICB)
Fisheries Society of the British Isles (FSBI)

SELECTED MEDIA COVERAGE

'Spotlight on Amar Surapaneni' SEB Magazine. Summer 2024	2024
'Never-Before-Seen Method For Making The Color Blue Found in Stingray Spots' Science Alert. Jul 16	2024
'Unraveling Nature's Electric Blues' Forbes. Jul 13	2024
'Ribbontail rays produce their dazzling blue spots without pigments' New Atlas. Jul 05	2024
'The colorful secret behind stingrays' electric blue spots' Advanced Science News. Mar 04	2024
'Blue is hard' Daily Tech News Show. Feb 27	2024
'Microscopic wrinkles in leaves ward off insects' Scientific American. Feb 01	2021
'Rubber tree plant leaves found to grow slippery to ward off insects as plant ages' Phys.org. Jan 14	2021
'Vibhinam...Vinuthnam', a highlight on student demonstration of superhydrophobicity Sakshi Newspaper, India. Mar 04	2016

EXTRA-CURRICULAR ACTIVITIES

Founder, 'Centre for Creative Arts', a student cultural activity club Bapatla Engineering College, Bapatla, India	2008
Organizer, 'Yuvam 08', a state-level youth festival Bapatla Engineering College, Bapatla, India. Feb 15-17	2008
Won one international award and many national and state level awards in sketching and painting, including five awards in popular national-level college fests such as Saarang' 08, Saarang' 09 at IIT Madras, India and Mood Indigo' 08 at IIT Bombay, India	1997-2009
Lower Diploma in Drawing Technical examinations, Government of Andhra Pradesh, India	2002