

## Sivasurender Chandran Ph.D.

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CONTACT INFORMATION	<p>Department of Physics, Indian Institute of Technology Kanpur, Kanpur 208016, India. <i>Website:</i> <a href="https://sites.google.com/view/sivasurenderchandran/home">https://sites.google.com/view/sivasurenderchandran/home</a> <i>Email:</i> <a href="mailto:schandran@iitk.ac.in">schandran@iitk.ac.in</a></p>
RESEARCH INTEREST	<p><b>Experimental Soft Matter Physics</b></p> <p>Structure formation and dynamic behavior of polymers, including glass transition and crystallization; Aging; Relaxation and viscoelastic behavior of polymers in restrictive spaces; Wetting and dewetting; Surfaces and interfaces; Self-assembly; Living liquid crystals.</p>
RESEARCH EXPERIENCE	<p><b>Assistant Professor</b>, Since June. 2020 <a href="#">Department of Physics, Indian Institute of Technology Kanpur</a>, Kanpur, India <i>Research:</i> Experimental Polymer and Soft Matter Physis</p> <p><b>Post-Doctoral Researcher</b>, Jan. 2020 to Mar. 2020 <a href="#">Department of Physics, University of Tübingen</a>, Tübingen, Germany <i>Research:</i> Epitaxial growth of small organic molecules</p> <p><b>Research Project Leader</b>, Jan. 2017 to Dec. 2019 <a href="#">Institute of Physics, University of Freiburg</a>, Freiburg, Germany <i>Research:</i> Behavior of polymers in non-equilibrium conditions</p> <p><b>Post-Doctoral Researcher</b>, Mar. 2014 to Dec. 2016 <a href="#">Institute of Physics, University of Freiburg</a>, Freiburg, Germany <i>Research:</i> Structure formation and dewetting dynamics of polymers</p> <p><b>Junior Research Associate</b>, Aug. 2013 to Feb. 2014 <a href="#">Indian Institute of Science</a>, Bengaluru, India <i>Research:</i> Microrheology of polymers and soft nanocolloids</p>
EDUCATION	<p><b>Ph.D. Physics</b>, Aug. 2008 to Jul. 2013 UGC Meritorious Fellow, <a href="#">Indian Institute of Science</a>, Bengaluru</p> <p><b>M.Sc. Materials Science</b>, Jul. 2006 to May 2008 University Gold Medalist [CGPA: 9.38/10], <a href="#">Anna University</a>, Chennai</p> <p><b>B.Sc. Physics</b>, Jul. 2003 to Apr. 2006 Best outgoing student [Marks: 85/100], <a href="#">Thiruvalluvar University</a>, Vellore</p>
RESEARCH GRANTS	<ul style="list-style-type: none"><li>• Jan. 2017 to Dec. 2019 (Duration: <i>36 Months</i>) <i>Title:</i> <a href="#">Identifying the transient cooperative processes behind the dynamic behavior of sheared polymer melts</a> <i>Grant Value:</i> 274300 €- grant for self-funding and research <i>Organization:</i> <a href="#">German Research Foundation (DFG)</a></li><li>• Apr. 2018 to Sep. 2018 (Duration: <i>6 Months</i>) <i>Title:</i> <a href="#">Microfluidic processing for tuning the properties of thin polymer fibers</a> <i>Grant Value:</i> 24200 €- seed grant for preparing proposal for external funding <i>Organization:</i> <a href="#">Freiburg Research Services, University of Freiburg</a></li><li>• Nov. 2015 to Apr. 2016 (Duration: <i>6 Months</i>) <i>Title:</i> <a href="#">Novel approaches for tuning the properties of polymer films</a> <i>Grant Value:</i> 24750 €- seed grant for preparing proposal for external funding <i>Organization:</i> <a href="#">Freiburg Research Services, University of Freiburg</a></li></ul>

MENTORING EXPERIENCE	<i>Ph.D.</i> : Mentored 3 Ph.D. students. <i>Others</i> : Supervised 6 students, with 2 in each (M.Sc., B.Sc., and B.Tech.,) degree.
REVIEWER	Scientific Reports, Journal of Applied Physics, Applied Physics Letters, Review of Scientific Instruments, and Journal of Applied Crystallography.
TECHNICAL EXPERIENCE	I have hands-on experience on the following X-ray synchrotron and free-electron facilities: <ul style="list-style-type: none"> <li>• European X-ray Free-Electron Laser, Hamburg, Germany (2019)</li> <li>• Argonne National Lab, Argonne, United States of America (2010)</li> <li>• Deutsches Elektronen-Synchrotron, Hamburg, Germany (2012 - 2019)</li> <li>• Photon Factory, Tsukuba, Japan (2011, 2013)</li> <li>• Raja Ramanna Center for Advanced Technology, Indore, India (2013).</li> </ul>
TEACHING & TUTORING EXPERIENCE	<p><b>In the University of Freiburg, Germany</b></p> <ul style="list-style-type: none"> <li>• <i>Experimental polymer physics and modeling</i> for graduate students Period: 2017-2018 – Winter semester</li> <li>• <i>Experimental physics – I</i> for under graduate students Period: 2014-2015, 2015-2016 and 2016-2017 – Winter semesters</li> <li>• <i>Experimental physics – II</i> for under graduate students Period: 2014 – Summer semester</li> <li>• <i>Experimental physics – IV</i> for advanced under graduate students Period: 2015 and 2016 – Summer semesters</li> </ul> <p><b>In the Indian Institute of Science, Bengaluru</b></p> <ul style="list-style-type: none"> <li>• <i>Physics of soft condensed matter</i> for graduate students Period: 2012 and 2013 – summer semesters</li> </ul>
AWARDS & HONORS	<ul style="list-style-type: none"> <li>• <i>Innovation fund</i> as a co-investigator from the Freiburg research services, University of Freiburg, Germany: Apr. 2018 to Sep. 2018</li> <li>• <i>Research grant</i> as a principal investigator from the German research foundation (DFG): Jan. 2017 to Dec. 2019</li> <li>• <i>Innovation fund</i> as a principal investigator from the Freiburg research services, University of Freiburg, Germany: Nov. 2015 to Apr. 2016</li> <li>• <i>Meritorious fellowship</i> from the University Grants Commission (UGC), India for pursuing PhD: Sept. 2008 to Jul. 2013</li> <li>• <i>University topper for all the 4 semesters</i> during my postgraduate studies in Anna University, Chennai: Dec. 2006 to Jun. 2008</li> <li>• <i>College topper</i>, in Physics and English, during my undergraduate studies in Muthurangam Govt. Arts College, Thiruvalluvar University, Vellore: May. 2004 to Jun. 2006</li> <li>• Invited for a <i>Master Class</i> talk in the Summer school on soft materials under external constraints, organized by the International Research Training group - Soft matter science, held at Center de Mittelwihr, France: 2014</li> </ul>
PUBLICATIONS	[1] " <i>Engineering interfacial entropic effects to generate giant viscosity changes in nanoparticle embedded polymer thin films</i> ", A. Swain, N. Begam, <b>S. Chandran</b> , M. S. Bobji, and J. K. Basu, accepted for publication, <i>Soft Matter</i> , 16, 4065 (2020).

- [2] *"Thermal stability and dynamics of soft nanoparticle membranes: Role of entropy, enthalpy and membrane compressibility"*, N. Das, N. Begam, **S. Chandran**, A. Swain, M. Sprung, and J. K. Basu, *Soft Matter*, 16, 1117 (2020).
- [3] *"Dewetting rheology for determining viscoelastic properties of non-equilibrated thin polymer films"*, A. Maulama, **S. Chandran**, K. Roumpos, A. O. Oduor, and G. Reiter, *Macromolecules*, 52, 7894 (2019).
- [4] *"Perspective: Processing pathways decide polymer properties at the molecular level"*, **S. Chandran\***, J. Baschnagel, D. Cangialosi, K. Fukao, E. Glynos, L. M. C. Janssen, M. Müller, M. Muthukumar, U. Steiner, J. Xu, S. Napolitano and G. Reiter, *Macromolecules*, 52, 7146 (2019). This work is selected as **ACS editor's choice**. Graphic summarizing the work is published as the cover art for this issue.
- [5] *"Segmental rearrangements relax stresses in nonequilibrated polymer films"* **S. Chandran\*** and G. Reiter, *ACS Macro Letters*, 8, 646 (2019).
- [6] *"Viscosity and fragility of confined polymer nanocomposites: A tale of two interfaces"*, N. Das, N. Begam, M. Ibrahim, **S. Chandran**, V. Padmanabhan, M. Sprung, and J. K. Basu, *Nanoscale*, 11, 8546 (2019).
- [7] *"Formation of periodically modulated polymer crystals"*, P. Poudel, S. Majumder, **S. Chandran**, H. Zhang, and G. Reiter, *Macromolecules*, 51, 6119 (2018).
- [8] *"Nanoparticle-polymer interfacial layer properties tune fragility and dynamic heterogeneity of athermal polymer nanocomposite films"*, N. Begam, N. Das, **S. Chandran**, M. Ibrahim, M. Sprung, V. Padmanabhan, and J. K. Basu, *Soft Matter*, 14, 8853 (2018).
- [9] *"Tuning relaxation dynamics and mechanical properties of polymer films of identical thickness"*, M. Kchaou, P. Alcouffe, **S. Chandran**, P. Cassagnau, G. Reiter and S. Al-Akhrass, *Phys. Rev. E*, 97, 032507 (2018).
- [10] *"Controlling polymer crystallization kinetics by sample history"*, P. Poudel, **S. Chandran\***, S. Majumder, and G. Reiter, *Macromol. Chem. Phys.*, 219, 1700315 (2018).
- [11] *"Time allowed for equilibration quantifies the preparation induced nonequilibrium behavior of polymer films"*, **S. Chandran\***, R. Handa, M. Kchaou, S. Al-Akhrass, A. N. Semenov, and G. Reiter, *ACS Macro Letters*, 6, 1296 (2017).
- [12] *"Transient cooperative processes in dewetting polymer melts"*, **S. Chandran\*** and G. Reiter, *Phys. Rev. Lett.*, 116, 088301 (2016).
- [13] *"Coherent X-ray scattering reveals nature of dynamical transitions in nanoparticle-polymer suspensions"*, **S. Chandran**, N. Begam, M. Sprung and J. K. Basu, *Polymer*, 105, 500 (2016).
- [14] *"Tuning morphologies of Langmuir polymer films through controlled relaxations of non-equilibrium states"*, **S. Chandran**, S. Dold, A. Buvignier, K-S. Krannig, H. Schlaad, G. Reiter and R. Reiter, *Langmuir* 31, 6426 (2015).
- [15] *"Suspensions of polymer-grafted nanoparticles with added polymers – Structure and effective pair-interactions"*, **S. Chandran**, S. Saw, A. K. Kandar, C. Dasgupta, M. Sprung and J. K. Basu, *J. Chem. Phys.*, 143, 084902 (2015).
- [16] *"Anomalous viscosity reduction and hydrodynamic interactions of polymeric nanocolloids in polymers"*, N. Begam, **S. Chandran**, M. Sprung and J. K. Basu, *Macromolecules*, 48, 6646 (2015).

- [17] *"Kinetics of dispersion of nanoparticles in thin polymer films at high temperature"*, N. Begam, **S. Chandran**, N. Biswas and J. K. Basu, *Soft Matter*, 11, 1165 (2015).
- [18] *"Dispersion of polymer grafted nanoparticles in polymer nanocomposite films: Insights from surface X-ray scattering and microscopy"*, **S. Chandran**, N. Begam, N. Biswas and J. K. Basu, *J. Appl. Phys.*, 116, 222203 (2014).
- [19] *"Confinement enhances dispersion in nanoparticle-polymer blend films"*, **S. Chandran**, N. Begam, V. Padmanabhan and J. K. Basu, *Nat. Commun.*, 5, 3697 (2014).
- [20] *"Variation in glass transition temperature of polymer nanocomposite films driven by morphological transitions"*, **S. Chandran**, J. K. Basu and M. K. Mukhopadhyay, *J. Chem. Phys.*, 138, 014902 (2013).
- [21] *"Effect of nanoparticle dispersion on glass transition in thin films of polymer nanocomposites"*, **S. Chandran** and J. K. Basu, *Eur. Phys. J. E*, 34, 99 (2011).
- [22] *"Re-entrant behavior in dynamics of binary mixtures of soft hybrid nanocolloids and homopolymers"*, **S. Chandran**, C. K. Sarika, A. K. Kandar, J. K. Basu, S. Narayanan and A. Sandy, *J. Chem. Phys.*, 135, 134901 (2011). This work is accepted for publication in Virtual journal of nanoscience and technology.
- [23] *"Communication: Unusual dynamics of hybrid nanoparticles and their binary mixtures"*, S. Srivastava, **S. Chandran**, A. K. Kandar, C. K. Sarika, J. K. Basu, S. Narayanan and A. Sandy, *J. Chem. Phys.*, 133, 151105 (2010). This work is accepted for publication in Virtual journal of nanoscience and technology.

\* - corresponding author of the paper

RECENT INVITED  
TALKS

- *Different faces of entropy for soft materials*, Sathyabama Institute of Science and Technology, Chennai, India (2020)
- *Entropic effects in soft matter*, Muthurangam Government Arts College, Vellore, India (2020)
- *Segmental rearrangements relax stresses in polymer films prepared under non-equilibrium conditions*, Université libre de Bruxelles (ULB), Bruxelles, Belgium (2019)
- *History dependent behavior of polymer melts*, Tata Centre for Interdisciplinary Sciences, Hyderabad, India (2019)
- *Time matters: Predicting and tailoring the non-equilibrium properties of polymer melts*, Indian Institute of Technology-Madras, Chennai, India (2018)
- *Transient cooperative processes in sheared polymer melts*, Indian Institute of Science, Bengaluru, India (2018)
- *Time matters in characterizing the preparation induced non equilibrium behavior of polymers*, Max Planck Institute of Polymer Research, Mainz, Germany (2017)
- *Transient cooperative processes in dewetting polymer melts*, Workshop on Amorphous Materials and Viscoelasticity, University of Strasbourg, Strasbourg, France (2017)