

Nickolas D. Polychronopoulos

Contact Info

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Professional Experience

May 1, 2020–Today Post-doctoral researcher
Centre for Research & Technology Hellas (CERTH)
Institute for Bio-Economy and Agri-Technology (iBO)

Oct. 1, 2018–Apr. 30, 2020 Research and Development Engineer
Polydynamics Inc., Dundas, Ontario, Canada
(full-time)

Sept. 1, 2017–Sept. 28, 2018 Production/Research and Development Engineer,
Rontis Hellas S.A. (Endovascular Department),
Larissa, Greece
(full-time)

Feb. 16, 2020–Today Full course teaching (4th year undergrad students):
Feb. 15, 2018–July 6, 2018 “MM820 (EN2500) Rheology and Processing of
Polymers, Department of Mechanical Engineering,
Univ. Thessaly, Volos, Greece
(part-time)

Mar. 1, 2016–Aug. 31, 2017 Research and Development Engineer
Polydynamics Inc., Dundas, Ontario, Canada
(full-time)

June 1, 2008– Feb. 28, 2016 Process Simulation Specialist
Polydynamics Inc., Dundas, Ontario, Canada
(part-time)

Education

PhD (2016)
Department of Mechanical Engineering, Univ. Thessaly, Volos, Greece
Thesis title: “Variable Cross-Section Flows in Polymer and Composites Processing” (written in English)

Master’s Degree (2012)
State-of-the-Art Methods in Energy, Processing and Antipollution Systems
Department of Mechanical Engineering, Univ. Thessaly, Volos, Greece
Thesis title: “Three Dimensional Flow Analysis in the Calendering Process”
(written in English)

Bachelor’s Degree (2007)
Department of Material Science, University of Patras, Patras, Greece.
Thesis title: “Molecular Mechanics: Theory and Simulations of Polymer Chains and Nanowires” (written in Greek)

- Publications in Peer-reviewed Journals
- J1. Polychronopoulos N.D., Sarris I.E., Vlachopoulos J., *Extension of Frenkel's Model of Viscous Sintering to Pore Shrinkage in Packings of Cylinders*, Chemical Engineering Science (submitted)
- J2. Polychronopoulos N.D., Vlachopoulos J., *The Role of Heating and Cooling in Viscous Sintering of Pairs of Spheres and Pairs of Cylinders*, Rapid Prototyping Journal (I.F.: 2.801), 26(4) 719-726 (2020)
- J3. Benos L.Th., Polychronopoulos N.D., Mahabaleshwar U.S., Lorenzini G., Sarris I.E., *Thermal and Flow Investigation of MHD Natural Convection in a Nanofluid Saturated Porous Enclosure: An Asymptotic Analysis*, Journal of Thermal Analysis and Calorimetry (I.F.: 2.471), published online 2019, doi: <https://doi.org/10.1007/s10973-019-09165-w>
- J4. Polychronopoulos N.D., Vlachopoulos J., *Computer Flow Simulation of Moffatt Eddies in Single Screw Extrusion*, International Polymer Processing (I.F.: 0.942), 33 (5) 662-668 (2018)
- J5. Polychronopoulos N.D., Charlton Z., Suwanda D., Vlachopoulos J., *Measurements and Comparison to Predictions of Viscosity of Heavily Filled HDPE with Natural Fibers*, Advances in Polymer Technology (I.F.:2.663), 37 (4) 1161-1167 (2018)
- J6. Polychronopoulos N.D., Papathanasiou T.D., *Fluid Penetration in a Deformable Permeable Web Moving Past a Stationary Rigid Solid Cylinder*, Transport in Porous Media (I.F.:1.997), 116 (1) 393-411 (2017)
- J7. Polychronopoulos N.D., Papathanasiou T.D., *A Novel Model for Resin Infiltration in Pin-Assisted Pultrusion*, Polymer Composites (I.F.: 2.268), 38 (12) 2653-2662 (2017)
- J8. Polychronopoulos N.D., Papathanasiou T.D., *A Study on the Effect of Drawing on Extrudate Swell in Film Casting*, Applied Rheology (I.F.: 1.442), 25 (4) 42425 (7 pages) (2015)
- J9. Polychronopoulos N.D., Papathanasiou T.D., *Pin-Assisted Resin Infiltration of Porous Substrates*, Composites Part A: Applied Science & Manufacturing (I.F.: 6.282), 71 126-135 (2015)
- J10. Polychronopoulos N.D., Sarris I.E., Papathanasiou T.D., *3D Features in the Calendaring of Thermoplastics: A Computational Investigation*, Polymer Engineering and Science (I.F.: 1.92), 54 (7), 1712-1722 (2014)
- Publications in Refereed Conference Proceedings
- P11. Polychronopoulos N.D., Vlachopoulos J., *Mathematical Modeling of Sintering of Two Cylinders in Fused Filament Fabrication*, American Institute of Physics (AIP) Conference Proceedings (accepted 2020)
Europe-Africa Regional Conference of the Polymer Processing Society (PPS2019), Pretoria, South Africa, Nov. 18-21 (2019)
- P12. Vlachopoulos J., Polychronopoulos N.D., Tanifuji S., *Computational analysis and design of single screw extruders having screws of complex geometry with mixing elements*, Society of Plastics Engineers (SPE) Conference Proceedings
EUROTEC, Barcelona, Spain, Nov. 3-7 (2011), available from: www.4spe.org

- Book Chapters
- C13. Polychronopoulos N.D., Papathanasiou T.D., Chapter 4: Flow-Induced Alignment in Injection Molding of Fiber Reinforced Polymer Composites, in *Flow-Induced Alignment in Composite Materials*, 2nd Edition, Papathanasiou T.D., Guell D.C. (Eds), Elsevier, Amsterdam, Netherlands (in preparation)
- C14. Polychronopoulos N.D., Vlachopoulos J., Chapter 4: Polymer Processing and Rheology, in *Functional Polymers. Polymers and Polymeric Composites: A Reference Series*, pages 133-180, Jafar Mazumder M., Sheardown H., Al-Ahmed A. (Eds), Springer Nature Switzerland AG, (2018)
- C15. Vlachopoulos J., Polychronopoulos N.D., Tanifuji S., Peter Müller J., Chapter 4: Flat Film and Sheet Dies, in *Design of Extrusion Forming Tools*, pages 113-140, Carneiro O.S. and Nobrega M. (Eds), Smithers Rapra, London, UK (2012)
- C16. Vlachopoulos J., Castillo R., Polychronopoulos N.D., Tanifuji S., Chapter 5: Blown Film Dies, in *Design of Extrusion Forming Tools*, pages 141-168, Carneiro O.S. and Nobrega M. (Eds), Smithers Rapra, London, UK (2012)
- C17. Vlachopoulos J., Polychronopoulos N.D., Chapter 1: Basic Concepts in Polymer Melt Rheology and Their Importance in Processing, in *Applied Polymer Rheology: Polymeric Fluids with Industrial Applications*, M. Kontopoulou (Ed.), pages 1-27, John Wiley & Sons, New Jersey, USA (2011)
- Invited Referred Publication
- I18. Thanasis D. Papathanasiou, Nickolas D. Polychronopoulos, Predicting the Extend of Resin Infiltration in Pin-Assisted Pultrusion, Society of Plastics Engineers (SPE) Technical Library, March 2016, available from: www.4spe.org
- Book
- B19. Vlachopoulos J., Polychronopoulos N.D., Understanding Rheology of Polymer Extrusion, 1st Edition, 340 pages, Polydynamics Inc, Dundas, Ontario, Canada (2019). Available from: https://www.researchgate.net/profile/Nickolas_Polychronopoulos
Used for:
- The participants of: Polydynamics 78th (Brussels), 79th (Borouge, Abu Dhabi, UAE) και 80th (AIMPLAS, Valencia, Spain) *International Short Course on Polymer Rheology and Extrusion*.
 - Teaching of “MM820 (EN2500) Rheology and Processing of Polymers” (2018, 2020 fall semesters), Department of Mechanical Engineering, Univ. Thessaly, Volos, Greece
- Presentations in Conferences
- Sharkskin, Melt Fracture and Die Lip Build Up*, 78th International Intensive Short Course on Polymer Rheology and Extrusion, Polydynamics Inc, Brussels, Belgium, May 16-17 (2019)
- Some New Results in Optimal Fluid Infiltration in a Flexible Permeable Substrate Moving Past a Rigid Cylinder*, 32nd International Conference of the Polymer Processing Society (PPS-32), Lyon, France, July 25-29 (2016)

Understanding the Production of Plastic Films, Sheets and Tapes through Mathematical Modeling, University of Groningen, The Netherlands, June 8 (2016)

Fluid Infiltration of a Permeable Substrate Moving Past a Solid Cylinder, Polymer Processing Society Conference 2015 (PPS2015), Graz, Austria, September 21-25 (2015)

A Modeling Study for the Pin-Assisted Pultrusion of Porous Substrates, 8th GRACM International Congress on Computational Mechanics, Volos, July 12-15 (2015)

A Modeling Study of the Pin-Assisted Resin Infiltration of Porous Substrates, 10th Panhellenic Conference in Chemical Engineering, Univ. Patras, Greece, June 4-6 (2015)

Spreading and Pressure Development in Calendering: A Three-Dimensional Approach, 29th International Conference of the Polymer Processing Society (PPS-29), Nuremberg, Germany, July 15-19 (2013)

Spreading and Pressure Development in Three-Dimensional Calendering of Thermoplastics, POH – 8th Panhellenic Conference in Fluid Flow Phenomena, Volos, Greece, November 16-17 (2012)

Some Experiences in Using the OpenFOAM Software for Polymer Processing Analysis, MontanUniversität Leoben, Leoben, Austria, July 16 (2012)

Computational analysis and design of single screw extruders having screws of complex geometry with mixing elements, SPE EUROTEC, Barcelona, Spain, November 3-7 (2011)

Challenges in Computer – Aided Polymer Extrusion Die Design, 6th GRACM International Congress on Computational Mechanics, Thessaloniki, June 19-21 (2008)

Reviewer	<ul style="list-style-type: none">• International Polymer Processing• Industrial & Engineering Chemistry Research• Journal of Materials Science
Undergraduate Thesis co-supervision	Koutsoukos T., Thomas T., “Simulation of Micropolar Fluid Flows: Validation of Numerical Results with Analytical Solutions” written in English
Teaching Assistant	<i>MM820 (EN2500) Rheology and Processing of Polymers</i> (May 2015) Department of Mechanical Engineering, Univ. Thessaly, Volos, Greece <i>MM503 (EN0301) Heat Transfer</i> (December 2014) Department of Mechanical Engineering, Univ. Thessaly, Volos, Greece
Industrial Experience	Rontis Hellas S.A. (Larissa, Greece) Research and Development/Production of polymeric intravascular coronary and peripheral balloon catheters including measurements of properties and performance. Computer simulations using ANSYS to determine maximum burst pressure for balloons and multilumen tubing sections for balloon catheters.

Polydynamics Inc. (Dundas, Ontario, Canada)

- Research and software development in Additive Manufacturing (especially in Selective Laser Sintering and Fused Filament Fabrication)
- Technical reports including flow analysis of polymeric and other types of materials, rheological interpretation of the results and development and improvement of software for many company customers including:

Austria

- Extrusion Die Systems (now Reifenhäuser Extrusion Systems), Kirchdorf an der Krems

Brazil

- Resiplastic Ind. E Com Ltda
- University of Campinas (UNICAMP), São Paulo

Canada

- Corma Inc, Toronto, Ontario
- Ingenia Polymer Corp, Calgary
- Switch Energy Corp., Clinton, Ontario

China

- Poly Plastic Masterbatch (SuZhou) Co., Ltd, Suzhou City

Egypt

- Ain Shams University, Cairo

Germany

- Tesa SE, Hamburg

Greece

- Plastika Kritis S.A., Iraklio, Crete
- Institute of Mechanics of Materials and Geostuctures (IMMG), Penteli, Athens
- Katradis Marine Ropes Ind. S.A., Piraeus

Italy

- CEAST-ITW Test & Measurement's Group Instron Division, Pianezza, Torino

Japan

- Hyper Advanced Simulation Laboratory (HASL), Tokyo

Spain

- University of Zaragoza

Taiwan

- DKSH Taiwan Ltd, Taipei City

Turkey

- Mikrosan Makina, Kocaeli

UK

- Malvern Instruments, Malvern

USA

- Ascend Performance Materials LLC, Houston, Texas
- B&P Littleford, Sanigaw, Michigan
- Barr Inc, Onsted, Michigan
- Graham Engineering, York, Pennsylvania
- Nitta Casings, New Jersey
- Oak Ridge National Laboratory, Tennessee
- Teknor Apex, Leominster, Massachusetts
- Trexel Inc., Wilmington, Massachusetts

Membership in
Professional
Societies

Society of Plastics Engineers (SPE), USA
Polymer Processing Society (PPS), International

References

1. Dr. Athanasios D. Papathanasiou (PhD supervisor)
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2. Dr. Savvas G. Hatzikiriakos (member of PHD committee)
Department of Chemical and Biological Engineering
The University of British Columbia
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Vancouver, British Columbia, V6T-1Z3 Canada
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3. Dr. Nikos Vlachos (instructor in several courses)
Department of Mechanical Engineering
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