Paul GRANDGEORGE

PhD – MECHANICS & MATERIALS SCIENCES

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MY PROFILE

Combining a strong **analytical mindset** and hands-on **lab experience** in **mechanical engineering** and **sustainable materials**, I aim to apply my **technical skills** to solve **practical problems** in the industrial context of **research and development** or **process/product optimization**.

RESEARCH AND INDUSTRIAL EXPERIENCE

Scientific researcher - Sustainable biopolymer-based materials (postdoc)

Roumeli Research Group – **University of Washington (UW)**

October 2021 – present — Seattle, USA

- **Project management** – **supervision**, **training** and **mentoring** of junior scientists
- **Development** and **characterization** of bio-based compostable **materials** (from cellulose and algae)
- **Data analysis** and **machine-learning** based **optimization** (Gaussian processes) in **Python**
- **Life cycle assessment** (LCA) of the designed materials with emphasis on **CO_2 sequestration**

Scientific researcher – Mechanics of fibers in frictional contact (postdoc)

Flexible Structures Laboratory – **École Polytechnique Fédérale de Lausanne (EPFL)**

March 2018 – September 2021 — Lausanne, Switzerland

- **Mechanical testing** of soft **polymeric** rods in contact with applications to **surgical knots**
- Developed **tailored measurement methods** (X-ray µCT, dip coating, high-speed imaging)
- Numerical **simulations** of soft rods in contact (using **Abaqus** with **Matlab** and **Python**)

Research & development Engineer – Industrial internship

Electro-Medical Systems (EMS)

March 2014 – August 2014 — Nyon, Switzerland

- Experimental characterization and optimization of a small-scale sandblast nozzle

Machining operator – Industrial internship

Nestlé Research Center

July 2011 – August 2011 — Vers-chez-les-Blanc, Switzerland

- Hands-on experience with **machining** and **mechanical design** (milling, lathing, CAD)

EDUCATION

Ph.D. in mechanics – Solid-liquid interfaces: elasticity and capillarity in silks

∂'Alembert institute – **Sorbonne Université**

March 2015 – February 2018 — Paris, France

Thesis title: Elasto-capillarity in fibrous media for the creation of ultra-extensible objects

- Study of the interactions between **elasticity** and **capillarity** in **silk** and **polymer fibers**
- Development of **custom experimental** measurements setups

BSc and MSc in mechanical engineering

École Polytechnique Fédérale de Lausanne (EPFL)

September 2009 – September 2014 — Paris, France

- Major in solid and fluid mechanics
- Awarded **excellence fellowship** during 3rd year of BSc

French "Baccalauréat" with international Dutch option

Lycée international de Ferney-Voltaire

July 2009 — Ferney-Voltaire, France

- Equivalent grade A pass with honors (Mention "'très bien" – 17.6/20)

SKILLS

Team work
Project management, scientific leadership, collaborative work

Manufacturing methods
Computer assisted design, machining, rapid prototyping, laser cutting, 3D printing

Material characterization
Material testing, spectroscopy methods, rheometry, nanoindentation, X-ray tomography, Life Cycle Assessment, FTIR, TGA, XRD, high-speed imaging

LANGUAGES

French: Native language
English: level C2
Spanish: level C2
Dutch: level C2
German: level A2
Italian: level A2

SOFTWARE

The basics
Python, Microsoft Office

Technical Software:
Matlab, Illustrator, Photoshop, Premiere Pro, imageJ, ffmpeg, GitHub, Mathematica, LabView, LATEX

Software in 3D/CAD
Abaqus FEA, SolidWorks, CATIA, Blender

TEACHING AND PROJECT SUPERVISION

Teaching assistant during my Ph.D. thesis and postdocs

Mechanical engineering and material science classes at Sorbonne Université, EPFL, and UW

September 2015– now — Paris-Lausanne-Seattle

- Preparation and **teaching** of classes to bachelor and master students
- Gave classes in **mechanics** and **materials science** (theoretical and practical

Supervised 15+ students research projects

Throughout my research projects at **Sorbonne Université, EPFL, and UW**

September 2015– now — Paris-Lausanne-Seattle

- **Roadmap** definition of scope of projects and ensuring research **progression**
- **Training** of students on specialized equipment and **general mentoring**

PUBLIC OUTREACH AND SCIENCE POPULARIZATION

Presentation of the sustainability Roumeli Lab to students of the Chief Leschi High School, Puyallup WA

University of Washington

April 2022 and April 2023 — Roumeli lab, Seattle, USA

- Demonstrations of sustainable biobased materials and processing/testing methods

English/French scientific vulgarization TV show – "Tech24"

Radio France Internationale and France24

December 2018 — ð'Alembert institute, Paris, France

- *Ultra-stretchable membrane using capillarity and elasticity* [Video Link]

French scientific vulgarization TV show – "E=m6"

French TV channel M6

January 2016 — ð'Alembert institute, Paris, France

- *Man versus animal: the game!* [Video Link]

PATENTS

- **Composite Membrane and Method for Manufacturing Such a Membrane** – Patent filed on March 10, 2017 – ref. FR1751950 (US patent US20200010989A1) – Authors: A. Antkowiak, **P. Grandgeorge**, N. Krins, and C. Laberty-Robert
- **Method of tuning mechanical properties of a bioplastic** – Patent filed on August 24, 2022 US patent Application 63/373,437 (Patent pending) – Authors: E. Roumeli, A. M. Jimenez, **P. Grandgeorge**, H. Iyer, I. Campbell, M. Holden, and K. Liao
- **Biological cement with algal biomatter** – Patent filed on August 24, 2022 US patent Application 63/373,439 (Patent pending) – Authors: E. Roumeli, M. Lin, **P. Grandgeorge**, and A. M. Jimenez

SELECTED PUBLICATIONS

19 publications in journals including *Science*, *PNAS,* and *Journal of Polymer Science*

- **P. Grandgeorge**, I. R. Campbell, H. Nguyen, R. Brain, M. Parker, S. Edmundson, D. Rose, K. Homolke, C. Subban, and E. Roumeli, Adhesion in thermomechanically processed seaweed-lignocellulosic composite materials, **MRS** Impact Bulletin, 49 (2024) [doi]
- J. L. Fredricks, A. M. Jimenez, **P. Grandgeorge**, R. Meidl, E. Law, J. Fan, and E. Roumeli, Hierarchical biopolymer-based materials and composites, **Journal of Polymer Science**, 61 (2023), 2585-2632 [doi]
- **P. Grandgeorge**, T. G. Sano, and P. M. Reis, An elastic rod in frictional contact with a rigid cylinder, Journal of the Mechanic and Physics of Solids (**JMPS**), 164 (2022), 104885 [doi]
- **P. Grandgeorge**, C. Baek, H. Singh, P. Johanns, T. G. Sano, J. H. Maddocks, and P. M. Reis, Mechanics of two filaments in tight orthogonal contact, Proceedings of the National Academy of Science (**PNAS**) – U.S.A, 118 (2021), 15 [doi]
- **P. Grandgeorge**, N. Krins, A. Hourlier-Fargette, C. Laberty-Robert, S. Neukirch, and A. Antkowiak, Capillarity-induced folds fuel extreme shape changes in thin wicked membranes, **Science**, 360 (2018), 296-299 [doi]

AWARDS & PRIZES

Best article in physics
Awarded by the Scientific Magazine "La Recherche" (2012)

Lutech 2018 Trophy
Awarded by the Technology Acceleration and Transfer Society SATT-Lutech (2018)

Excellence Fellowship
Awarded by EFPL for outstanding academic performance

HOBBIES

Taekwondo, Football, Hiking, Salsa, Running, Triathlon, Philosophy & Religion, travelling

REFERENCES

Prof. Eleftheria Roumeli
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Head of the Roumeli Lab (UW)

Prof. Pedro M. Reis
pedro.reis@epfl.ch
Head of the FlexLab (EPFL)

Prof. Sébastien Neukirch
sebastien.neukirch@sorbonne-universtie.fr
CNRS Professor at the ð'Alembert institute (Sorbonne Université)