

Eugenio Damiano

Curriculum Vitae



Education

- 2016–Present **Ph.D. Student in Experimental Physics (without grant)**, *Università di Siena, Siena (Italy)*.
- 2017–2018 **Scholarship holder**, *Dipartimento di Fisica - Università di Pisa, Pisa (Italy)*.
Study and development of solid-state lasers in the visible
- 2015–2017 **Scholarship holder**, *Dipartimento di Fisica - Università di Pisa, Pisa (Italy)*.
Study on the growth of single-crystal fibers as active media for solid-state lasers
- 2013–2015 **Master of Science in Physics**, *Università di Pisa, Italy*, 110/110.
- 2009–2013 **Bachelor of Science in Physics**, *Università di Pisa, Italy*, 98/110.
- 2004–2009 **Scientific High School Degree**, *Liceo A. Aprosio, Ventimiglia (Italy)*, 97/100.

Master's Degree

List of sustained exams (grade) [ECTS]

- Quantum Optics (30/30) [9 ECTS]
- Structure of Matter 2 (30/30) [9 ECTS]
- Quantum Optics Laboratory (27/30) [12 ECTS]
- Solid State Lasers (30/30) [3 ECTS]
- Molecular Physical Chemistry (30/30) [9 ECTS]
- Solid State Physics (28/30) [9 ECTS]
- Astroparticle A (29/30) [6 ECTS]
- Atom Optics (30/30) [9 ECTS]
- Statistical Physics (29/30) [9 ECTS]

05/11/2018



Master's Thesis

Title *Near infrared laser sources in CW and passive Q-switched regimes based on Tm^{3+} and Nd^{3+}*

Supervisor Dr. Stefano Veronesi

Description A spectroscopic analysis of six sample of $\text{Tm}^{3+}:(\text{Lu}_x\text{Gd}_{1-x})_3\text{Ga}_5\text{O}_{12}$ (Tm:LGGG) with different Tm and Lu concentration has been performed. In particular, the Stark sublevels energy of $^3\text{H}_6$ and $^3\text{F}_4$ manifolds have been determined via low-temperature spectroscopy. This is the first spectroscopic characterization for this material. Diode-pumped laser emission has been achieved for the first time with this host, with a maximum slope efficiency of 20% and maximum output power of 170 mW centered at 2013 nm, with evidence of multiline structure. Moreover a characterization of laser emission at 1 micron, both CW, and Q-switched, for a Nd:LGGG sample has been accomplished.

Bachelor Thesis

Title *UV Laser Sources with Cerium-doped Fluorides*

Supervisor Dr. Stefano Veronesi

Publications

Research Papers

- [1] S. Veronesi, Z. Jia, D. Parisi, E. Damiano, W. Mu, Y. Yin, M. Tonelli, and X. Tao. "Spectroscopy and diode pumped laser emission in $(\text{Lu}_x\text{Gd}_{1-x})_3\text{Ga}_5\text{O}_{12}:\text{Tm}^{3+}$ single crystal". In: *Journal of Physics D: Applied Physics* 48, 385302 (Sept. 2015), p. 385302. DOI: 10.1088/0022-3727/48/38/385302.
- [2] A. Sottile, E. Damiano, and M. Tonelli. "Diode-pumped laser operation of $\text{Pr}^{3+}:\text{Ba}(\text{Y}_{0.8}\text{Lu}_{0.2})_2\text{F}_8$ in the visible region". In: *Opt. Lett.* 41.23 (2016), pp. 5555–5558. DOI: 10.1364/OL.41.005555.
- [3] E. Damiano, J. Shu, A. Sottile, and M. Tonelli. "Spectroscopy and visible laser operations of a μ -PD grown $\text{Pr}^{3+}:\text{LiYF}_4$ single-crystal fiber". In: *Journal of Physics D: Applied Physics* 50.13 (Mar. 2017), p. 135107. URL: <http://stacks.iop.org/0022-3727/50/i=13/a=135107>.
- [4] Shu, J. and Damiano, E. and Sottile, A. and Zhang, Z. and Tonelli, M. "Growth by the μ -PD Method and Visible Laser Operation of a Single-Crystal Fiber of $\text{Pr}^{3+}:\text{KY}_3\text{F}_{10}$ ". In: *Crystals* 7 (2017). ISSN: 2073-4352. URL: <http://www.mdpi.com/2073-4352/7/7/200>.
- [5] A. Sottile, E. Damiano, M. Rabe, R. Bertram, D. Klimm, and M. Tonelli. "Widely tunable, efficient 2 μm laser in monocrystalline $\text{Tm}^{3+}:\text{SrF}_2$ ". In: *Opt. Express* 26.5 (2018), pp. 5368–5380. DOI: 10.1364/OE.26.005368. URL: <http://www.opticsexpress.org/abstract.cfm?URI=oe-26-5-5368>.

- [6] E. Damiano, E. Cavalli, A.Yu. Tarasova, L.I. Isaenko, and M. Tonelli. "Polarized optical spectra of Ho^{3+} -doped KPb_2Cl_5 single-crystal". In: *J. Lumin.* 199 (C 2018), pp. 71–77. DOI: 10.1016/j.jlumin.2018.02.068.
- [7] Jun Shu, Zhitai Jia, **Eugenio Damiano**, Haoyuan Wang, Yanru Yin, Na Lin, Xian Zhao, Xinguang Xu, Mauro Tonelli, and Xutang Tao. "Charge compensations of Eu^{2+} and O_i^{2-} co-exist in Eu^{3+} : CaMoO_4 single-crystal fibers grown by micro-pulling-down method". In: *CrystEngComm* (2018). DOI: 10.1039/c8ce01160e. URL: <https://doi.org/10.1039/c8ce01160e>.

Proceedings

- [8] A. Sottile, S. Veronesi, E. Damiano, D. Parisi, and M. Tonelli. "Spectroscopy and laser operation of Pr^{3+} : $\text{Ba}(\text{Y}_{0.8}\text{Lu}_{0.2})_2\text{F}_8$ single crystal". In: *7th EPS-QEOD Europhoton Conference*, no. PO-3.8, Vienna, Austria, 21-26 August 2016.
- [9] J. Shu A. Sottile E. Damiano and M. Tonelli. "Visible Laser Operation of a μ -PD Grown Pr^{3+} : LiYF_4 Single Crystal Fiber". In: *DGKK - Arbeitskreis "Kristalle für Laser und Nichtlineare Optik" Leibniz Institute for Crystal Growth Berlin, Germany September 15 - 16, 2016*.
- [10] Z. Zhang J. Shu S. Veronesi D. Parisi A. Di Lieto A. Sottile E. Damiano and M. Tonelli. "Visible laser operation in Pr-doped fluoride crystals grown by the micro-pulling-down method". In: *Italian Physical Society (SIF) 102nd National Congress, Padova, Italy, 26 - 30 September 2016*.
- [11] A. Sottile, E. Damiano, Z. Zhang, and M. Tonelli. "Visible laser operation of a Pr^{3+} : KY_3F_{10} single-crystal fibre". In: *Fotonica 2017 AEIT, Padova, Italy 3-5 May 2017*.
- [12] A. Sottile, E. Damiano, and M. Tonelli. "Wavelength tuning in a diode-pumped Pr^{3+} : $\text{Ba}(\text{Y}_{0.8}\text{Lu}_{0.2})_2\text{F}_8$ laser". In: *CLEO/EUROPE Conference - EQEC 2017, Munich, Germany, 25-29 June 2017*.
- [13] A. Sottile, E. Damiano, M. Rabe, R. Bertram, D. Klimm, and M. Tonelli. "Efficient and Broadly Tunable Eye-Safe Laser Operation in a Single Crystal of Tm-Doped Strontium Fluoride ($\text{Tm}:\text{SrF}_2$)". In: *Conference on Lasers and Electro-Optics*. Optical Society of America, 2018, SM4N.2. DOI: 10.1364/CLEO_SI.2018.SM4N.2.

Experimental Skills

- Study and development of diode-pumped solid-state lasers in the infrared and visible region
- Development of tunable laser sources in the visible and IR region
- Design and realization of optical cavities for laser applications
- Crystal growth of rare-earth doped single crystals by micro-pulling-down and Czochralski methods
- Solid state spectroscopy in the UV-VIS-NIR regions
- Use of optical and laser devices
- Familiarity with optical and electronic laboratory apparatus

Computer Skills

- General knowledge Good knowledge of Windows and Linux OS. Proficient in Office-like suites and $\text{\LaTeX}$.
- Programming languages PYTHON, C, C++, HTML, XML, PHP (basics)
- Data analysis Mathematica, Origin, Gnuplot, Python scientific libraries, Matlab
- Misc. Autodesk Inventor (Technical Design), Inkscape, GIMP (Graphics), Arduino (Electronic prototyping platform)

Communication and Organizational Skills

- o Good interpersonal skills, friendly, good listener
- o Open to constructive criticism, patient, able to inspire trust,
- o Methodical organization of work acquired during the studies and the thesis work
- o Meticulous eye for detail. Practical approach to problem solving.

Languages (self-assessment)

	Understanding		Speaking		Writing
	Listening	Reading	Interaction	Production	
Italian	Mothertongue				
English	C1	C1	C1	C1	C1
French	A2	A2	A2	A2	A2

Other activities

2016–Present **OSA Student Chapter Member - Co-founder and Treasurer, Università di Pisa.**

2016–Present **Greenpeace volunteer, Pisa Local Group.**

05/11/2018

