

## Professional Experiences:

### ❖ Research Activities

**01/04/2018-Present: Postdoctoral researcher at the Brescia University, Brescia, Italy:**

➤ **Activities:**

- Implement the experimental setup to study spatial beam cleaning in active multimode fibers (Ytterbium, Erbium-Ytterbium).
- Study amplification in multimode fibers.
- Supercontinuum generation with active multimode fibers.
- Design and realization of multimode fiber lasers.
- Generate frequency combs in multimode fiber.

**01/10/2016-31/08/2017: Research assistant at the University of Angers, Angers, France:**

➤ **Activities:**

- Generation of square pulses “Dissipative Soliton Resonance (DSR) in fiber lasers.
- Graphene deposition on optical fiber taper for mode-locked fiber lasers.
- Optimization of ultra-long cavities for the generation of energetic pulses (influence of variable coupling ratio and coupled cavities).
- Co-supervision intern students.

**01/10/2011-10/12/2014: Ph.D. research fellow at the Laboratory of Photonics of Angers (LPhiA), the University of Angers, Angers, France:**

➤ **Thesis Title:** Manipulating a large number of dissipative solitons in fiber lasers.

➤ **Activities:**

- Realization of mode-locked ultrashort (solitons) fiber laser by nonlinear rotation of the polarization and the nonlinear loop mirror.
- Manipulation of different types of optical fibers (dispersion management): standard single-mode fiber, dispersion-shifted fiber, erbium / ytterbium co-doped fiber.
- Characterization of ultra-short pulses (solitons) and their interactions.
- Control of interactions between the pulses of passively mode-locked laser by another continuous laser (optical injection).
- Numerical simulation.
- Co-supervision intern students.

### ❖ Teaching Activities

**12/10/2017-30/01/2018: Part-time lecturer at the Agricultural Engineering School “ESA” of Angers, France for first year Engineering students:**

- Tutorials: Electricity, Mechanics and Fluid mechanics.

- 01/09/2017-31/03/2018: Contractual teacher at the youth detention center of Porcheville, Porcheville, France:**
- Tutorials: Mathematics and Sciences.
- 01/10/2016-31/08/2017: Teacher assistant at the University of Angers, Angers, France for first year and second year of Bachelor's degrees:**
- Practical work: Optics, Electronics, Thermodynamics, Electrokinetics, Electrostatics.
  - Tutorials: Electronics, Physics, Physical and Chemical aspects.
- 12/10/2016-30/01/2017: Part-time lecturer at the Agricultural Engineering School "ESA" of Angers, France for first year Engineering students:**
- Tutorials: Electricity, Mechanics and Fluid mechanics.
- 02/11/2015-31/08/2016: Contractual teacher at Estournelles Polyvalent high school, La Flèche, France:**
- Tutorials: Mathematics and Sciences.

## Education:

- 2011-2014: Ph.D. in Physics, specialty "Optics and Photonics", University of Angers, France.**
- 2009-2011: Masters in Physics "Photonics Signal and Imaging (PSI)", University of Angers, France.**
- 2008-2009: Masters (M1) in Applied Physics, University of Cheikh Anta Diop of Dakar, Dakar, Senegal.**
- 2004-2008: Bachelor in Physics, University of Cheikh Anta Diop of Dakar, Dakar, Senegal.**

## Scientific and technical skills:

### Scientific

- Spatio-temporal characterization of ultrashort pulses.
- Study spatial beam cleaning in active and passive multimode fibers.
- Designing and realization fiber lasers (single and multi-mode).
- Achieve nonlinear frequency conversion (Raman effect, Second Harmonic Generation, (SHG), Supercontinuum Generation (SCG)) in the multimode fiber.
- Acquisition methods and optical characterization techniques.
- Deposition of Graphene on optical fiber taper.

### Informatics

- Matlab,
- Labview,
- Fiberdesk.

### Linguistic

- French,
- English,
- Italian.

## Publications:

1. Marc Fabert, Maria Săpânțan, Katarzyna Krupa, Alessandro Tonello, Yann Leventoux, Sébastien Février, Tigran Mansuryan, **Alioune Niang**, Benjamin Wetzel, Guy Millot, Stefan Wabnitz, Vincent Couderc, "Coherent combining of self-cleaned multimode beams," *Sci Rep* 10, 20481 (2020).
2. Fabio Mangini, Mario Ferraro, Mario Zitelli, **Alioune Niang**, Alessandro Tonello, Vincent Couderc, and Stefan Wabnitz, "Multiphoton-Absorption-Excited Up-Conversion Luminescence in Optical Fibers," *Phys. Rev. Applied* 14, 054063 (2020).
3. Tobias Hansson, Alessandro Tonello, Tigran Mansuryan, Fabio Mangini, Mario Zitelli, Mario Ferraro, **Alioune Niang**, Rocco Crescenzi, Stefan Wabnitz, Vincent Couderc, "Nonlinear beam self-imaging and self-focusing dynamics in a GRIN multimode optical fiber: theory and experiments," *Opt. Express* 28, 24005-24021 (2020).
4. Mario Zitelli, Fabio Mangini, Mario Ferraro, **Alioune Niang**, Denis Kharenko, and Stefan Wabnitz, "High-energy soliton fission dynamics in multimode GRIN fiber," *Opt. Express* 28, 20473-20488 (2020).
5. **Alioune Niang**, Daniele Modotto, Alessandro Tonello, Fabio Mangini, Umberto Minoni, Mario Zitelli, Marc Fabert, Mesay Addisu Jima, O. N. Egorova, Andrey E. Levchenko, Sergei L. Semjonov, Denis S. Lipatov, Sergey Babin, Vincent Couderc, and Stefan Wabnitz, "Spatial Beam Self-Cleaning in Tapered Yb-Doped GRIN Multimode Fiber With Decelerating Nonlinearity," *IEEE Photonics Journal* 12, 6500308 (2020).
6. **A. Niang**, T. Mansuryan, K. Krupa, A. Tonello, M. Fabert, P. Leproux, D. Modotto, O. N. Egorova, A. E. Levchenko, D. S. Lipatov, S. L. Semjonov, G. Millot, V. Couderc, and S. Wabnitz, "Spatial beam self-cleaning and supercontinuum generation with Yb-doped multimode graded-index fiber taper based on accelerating self-imaging and dissipative landscape," *Opt. Express* 27, 24018-24028 (2019).
7. Katarzyna Krupa, Graciela Garmendia Castañeda, Alessandro Tonello, **Alioune Niang**, Denis S. Kharenko, Marc Fabert, Vincent Couderc, Guy Millot, Umberto Minoni, Daniele Modotto, and Stefan Wabnitz, "Nonlinear polarization dynamics of Kerr beam self-cleaning in a graded-index multimode optical fiber," *Opt. Lett.* 44, 171-174 (2019).
8. Fatma Ben Braham, Georges Semaan, **Alioune Niang**, Andrey Komarov, Faouzi Bahloul, Mohamed Salhi, Konstantin Komarov and François Sanchez, "Wave-breaking-free passively mode-locked fiber laser using a hybrid regime of oscillation", *Laser Phys. Lett.* 15, pp. 095401 (2018).
9. M Salhi, G Semaan, F Ben Braham, **A Niang**, F Bahloul, F Sanchez, "Broadly peak power and pulse width tunable dissipative soliton resonance generation in figure of eight fiber laser", *Rom. Rep. Phys.* 70, pp.1-6 (2018).
10. Georges Semaan, Andrey Komarov, **Alioune Niang**, Mohamed Salhi, and François Sanchez, "Spectral dynamics of square pulses in passive mode-locked fiber lasers", *Physical Review A* 97, pp. 023812 (2018).
11. Paul Mouchel, Georges Semaan, **Alioune Niang**, Mohamed Salhi, Marc Le Flohic and François Sanchez, "High power passively mode-locked fiber laser based on graphene nanocoated optical taper", *Appl. Phys. Lett.* 111, pp. 031106 (2017).
12. G. Semaan, **A. Niang**, M. Salhi and F. Sanchez, "Harmonic dissipative soliton resonance square pulses in anomalous dispersion passively mode locked fiber ring laser", *Laser Phys. Lett.* 14, pp. 055401 (2017).
13. **A. Niang**, F. Amrani, M. Salhi, H. Leblond and F. Sanchez, "Influence of gain dynamics on dissipative soliton interaction in the presence of a continuous wave", *Phys. Rev. A.* 92, pp 033831, (2015).
14. Yichang Meng, Georges Semaan, Mohamed Salhi, **Alioune Niang**, Khmaies Guesmi, Zhi-chao Luo, and Francois Sanchez, "High power L-band mode-locked fiber laser based on topological insulator saturable absorber", *Opt. Exp.* 23, pp. 23053-23058 (2015).
15. Yichang Meng, Mohamed Salhi, **Alioune Niang**, Khmaies Guesmi, Georges Semaan, and Francois Sanchez, "Mode-locked Er:Yb doped double-clad fiber laser with 75 nm tuning range", *Opt. Lett.* 40, pp. 1153-1156 (2015).
16. Yichang Meng, **Alioune Niang**, Khmaies Guesmi, Mohamed Salhi, and Francois Sanchez, "1.61  $\mu\text{m}$  high-order passive harmonic mode locking in a fiber laser based on graphene saturable absorber", *Opt. Exp.* 22, pp. 29921-29926 (2014).
17. Khmaies Guesmi, Yichang Meng, **Alioune Niang**, Paul Mouchel, Mohamed Salhi, Faouzi Bahloul, Rabah Attia, and François Sanchez, "1.6  $\mu\text{m}$  emission based on linear loss control in Er:Yb doped double-clad fiber laser", *Opt. Lett.* 39, pp. 6383-6386 (2014).
18. F. Sanchez, Ph Grelu, H. Leblond, M. Salhi, A. Komarov, K. Komarov, **A. Niang**, F. Amrani, C. Lecaplain and S. Chouli, "Manipulating dissipative soliton ensembles in passively mode-locked fiber lasers", *Invited Paper, Optical and Fiber Technology*, 20, pp. 562-574 (2014).
19. **Alioune Niang**, Foued Amrani, Mohamed Salhi, Philippe Grelu, and François Sanchez, "Rains of solitons in a figure-of-eight passively mode-locked fiber laser", *Appl Phys B.* 116, pp. 771-775 (2014).
20. **A. Niang**, F. Amrani, M. Salhi, H. Leblond, A. Komarov and F. Sanchez, "Harmonic mode-locking in a fiber laser through continuous external optical injection", *Opt Com.* 312, pp. 1-6, (2014).
21. Andrey Komarov, Konstantin Komarov, **Alioune Niang**, and François Sanchez, "Nature of soliton interaction in fiber lasers with continuous external optical injection", *Phys. Rev.A.* 89, pp. 013833, (2014).
22. H. Leblond, **A. Niang**, F. Amrani, M. Salhi, and F. Sanchez, "Motion of solitons of the complex Ginzburg-Landau equation: The effect of an external frequency-shifted source", *Phys. Rev.A.* 88, pp 033809, (2013).
23. **A. Niang**, F. Amrani, M. Salhi, A. Komarov, K. Komarov, H. Leblond and F. Sanchez, "Characterization of a 10 W single-mode Er:Yb doped double-clad fiber laser", *J. Opt. Adv. Mat.* 15, pp. 621-626, (2013).

24. François Sanchez, Foued Amrani, **Alioune Niang**, Mohamed Salhi, Andrey Komarov, "Characterization of a high-power erbium-doped fiber laser", *IJMA (International Journal of Microwave Applications)*. 2, pp. 89-92, (2013).
25. Foued Amrani, **Alioune Niang**, Mohamed Salhi, Andrey Komarov, Herve Leblond, and François Sanchez, "Passive harmonic mode locking of soliton crystals", *Opt. Lett.* 36, pp. 4239-4241, (2011).

## Conferences:

### ➤ Proceedings:

1. **A. Niang**, D. Modotto, A. Tonello, F. Mangini, U. Minoni, M. Fabert, M.A. Jima, O.N. Egorova, A.E. Levchenko, S.L. Semjonov, D.S. Lipatov, V. Couderc, and S. Wabnitz, "Beam self-cleaning in tapered Ytterbium-doped multimode fiber with decelerating nonlinearity", in *Conference on Lasers and Electro-Optics*, OSA Technical Digest (Optical Society of America, 2020), paper SM4P.3. (Oral presentation).
2. **A. Niang**, F. Mangini, D. Modotto, A. Tonello, U. Minoni, M. Fabert, V. Couderc, and S. Wabnitz, "Spatial beam self-cleaning dynamics in Erbium-Ytterbium (Er-Yb) codoped multimode fiber", *paper accepted for oral presentation at Advanced Photonics Congress 2020, Jun 2020*.
3. **A. Niang**, D. Modotto, A. Tonello, F. Mangini, U. Minoni, M. Zitelli, M. Fabert, M. Jima, O. Egorova, A. Levchenko, S. Semjonov, D. Lipatov, S. Babin, V. Couderc, and S. Wabnitz, "Nonlinear beam cleanup in Yb-doped GRIN multimode fiber taper", *paper accepted for oral presentation at Advanced Photonics Congress 2020, Jun 2020*.
4. **Alioune NIANG**, Vincent COUDERC, Alessandro TONELLO, Katarzyna KRUPA, Mesay ADDISU, Raphaël JAUBERTEAU, Marc FABERT, Daniele MODOTTO, and Stefan WABNITZ, "Self-cleaning on a higher order mode in Ytterbium-doped multimode fiber with parabolic profile," in *Conference on Lasers and Electro-Optics*, OSA Technical Digest (Optical Society of America, 2019), paper STh4L.1. (Oral presentation).
5. **A. Niang**, T. Mansuryan, K. Krupa, A. Tonello, M. Fabert, P. Leproux, D. Modotto, G. Millot, V. Couderc, and S. Wabnitz, "Spatial Kerr beam self-cleaning in Yb-doped multimode fiber taper," in *2019 Conference on Lasers and Electro-Optics Europe and European Quantum Electronics Conference*, OSA Technical Digest (Optical Society of America, 2019), paper ef\_p\_27. (Oral presentation).
6. **A. Niang**, T. Mansuryan, K. Krupa, A. Tonello, M. Fabert, P. Leproux, D. Modotto, G. Millot, V. Couderc, and S. Wabnitz, "Spatial and Spectral Nonlinear Beam Control with Active Multimode Graded Index Fiber Taper," in *Nonlinear Optics (NLO)*, OSA Technical Digest (Optical Society of America, 2019), paper NTu1A.2.). (Oral presentation).
7. **Stefan Wabnitz, Alioune Niang**, Daniele Modotto, Alain Barthélémy, Alessandro Tonello, Vincent Couderc, Vincent Kermene, Agnès Desfarges-Berthelemot, Marc Fabert, Etienne Deliancourt, Katarzyna Krupa, Guy Millot, "Multidimensional Shaping of Spatiotemporal Waves in Multimode Nonlinear Fibers," *2019 21st International Conference on Transparent Optical Networks (ICTON)*, Angers, France, 2019, pp. 1-4. doi: 10.1109/ICTON.2019.8840457. (Oral presentation).
26. **G. Semaan, A. Niang**, M. Salhi, and F. Sanchez, "Harmonic dissipative soliton resonance passively modelocked fiber laser," in *Conference on Lasers and Electro-Optics*, OSA Technical Digest (online) (Optical Society of America, 2018), paper FTh1M.5. (Oral presentation).
8. **M Salhi**, G Semaan, F Ben Braham, M Kemel, **A Niang**, Y Meng, A Komarov, K Komarov, F Sanchez «Dissipative soliton resonance in the Er: Yb: doped double-clad fiber laser», *Nonlinear Optics and its Applications 2018, SPIE Vol.10684, 1068415 (2018)*. (Oral presentation).
27. **A. Niang**, G. Semaan, F. Ben Braham, M. Salhi and F. Sanchez, "Dynamics of dissipative soliton resonance square pulses in fiber lasers", *Proc. Int. Conf. Transparent Opt. Netw.*, DOI: [10.1109/ICTON.2017.8024819](https://doi.org/10.1109/ICTON.2017.8024819), (2017). (Oral presentation).
28. F. Ben Braham, G. Semaan, **A. Niang**, F. Bahloul, M. Salhi and F. Sanchez, "Exhaustive study of dissipative soliton resonance in a dual amplifier passively mode-locked fiber laser", *Proc. Int. Conf. Transparent Opt. Netw.*, DOI: [10.1109/ICTON.2017.8025099](https://doi.org/10.1109/ICTON.2017.8025099), (2017). (Poster presentation).
29. **G. Semaan, Y. Meng**, M. Salhi, **A. Niang**, K. Guesmi, **Z.C. Luo, F. Sanchez**, "High power passive mode-locked L-band fiber laser based on microfiber topological insulator saturable absorber", *Proceedings of SPIE Vol. 9893, 98930R* (2016). (Poster).
30. **Yichang Meng**, Khmaies Guesmi, **Alioune Niang**, Mohamed Salhi, Faouzi Bahloul, Georges Semaan, François Sanchez, "1.6 μm laser emission from the Er:Yb doped double-clad fiber amplifier," *2015 17th International Conference on Transparent Optical Networks (ICTON)*, Budapest, 2015, pp. 1-4. doi: 10.1109/ICTON.2015.7193728. (Oral presentation).
31. **A. Niang**, F. Amrani, M. Salhi, H. Leblond, A. Komarov and F. Sanchez, "Control of soliton pattern through continuous external injection", *Proceedings of SPIE Vol. 9136, 91361A* (2014). (Poster presentation).
32. **A. Niang**, F. Amrani, M. Salhi, H. Leblond, A. Komarov, K. Komarov and **F. Sanchez**, "Manipulation of large solitons ensembles in Er-doped double clad fiber laser", in *Advanced Photonics*, OSA Technical Digest (online) (Optical Society of America, 2014), paper NM2A.2. (Oral presentation).
33. **A. Niang**, F. Amrani, M. Salhi, H. Leblond, A. Komarov, and **F. Sanchez**, "Control of harmonic mode-locking in a fiber laser by continuous external optical injection", *Proc. Int. Conf. Transparent Opt. Netw.*, DOI: [10.1109/ICTON.2014.6876669](https://doi.org/10.1109/ICTON.2014.6876669), (2014). (Oral presentation).

34. M. Salhi, **A. Niang**, F. Amrani, H. Leblond, and F. Sanchez, "High power continuous wave and pulsed single mode Er:Yb doped double-clad fiber laser", *Proc. Int. Conf. Transparent Opt. Netw.*, DOI: [10.1109/ICTON.2013.6602793](https://doi.org/10.1109/ICTON.2013.6602793), (2013). (Oral presentation).
35. Sanchez F., Amrani F., **Niang A.**, Salhi M., Komarov A. "Characterization of a high-power erbium-doped fiber laser". *International Journal of Microwaves Applications*. 2013. Vol. 2 p. 89-92. (Oral presentation)
36. F. Amrani, M. Salhi, **A. Niang**, A. Komarov and F. Sanchez, "Soliton pattern formations in figure-of-eight laser », Proceedings of SPIE Vol. 8434, 843403 (2012). (Oral presentation).
37. F. Amrani, **A. Niang**, M. Salhi, A. Komarov, H. Leblond, and F. Sanchez, "Passive mode-locking of a 10 W double-clad fiber laser", *Proc. Int. Conf. Transparent Opt. Netw.*, DOI: [10.1109/ICTON.2012.6253897](https://doi.org/10.1109/ICTON.2012.6253897), (2012). (Oral presentation).
38. F Sanchez, M Salhi, A Komarov, F Amrani, **A Niang**, "Soliton Patterns Formation in Fiber Lasers", Proceedings of International Conference "Solitons, Collapses and Turbulence"(Novosibirsk, Russia), 2012 pp. 122-123. (Oral presentation).

### ➤ Other communications:

1. Leblond H., Amrani F., **Niang A.**, Malomed B. A., Besse V., «Motion of solitons in CGL-type equations», *The Fourth International Conference Nonlinear Waves, Theory and Application, Beijing, China, 25-28 juin 2016*. (Invited Speech).
2. F. Sanchez, F. Amrani, **A. Niang** and M. Salhi « Caractérisation d'un laser à fibre dopée erbium de très forte puissance », *TELECOM'2013 & 8ème JFMMMA, Marrakech, Maroc, 13-15 Mars 2013*. (Oral presentation).
3. **A. Niang**, F. Amrani, M. Salhi, A. Komarov, K. Komarov, H. Leblond and F. Sanchez, "Control of soliton patterns in passively mode-locking fiber laser", *International Conference on Optics, Photonics and their Applications (ICOPA), Algiers, Algeria, 9-11 December 2013*. (Oral presentation).
4. **A. Niang**, F. Amrani, M. Salhi, A. Komarov, K. Komarov, H. Leblond and F. Sanchez, "Instability of a Soliton Crystal in a High Power Fiber" *ICONO/LAT 2013, Moscow, Russia, 18-22 June 2013*. (Invited Speech).
5. M. Salhi, **A. Niang**, F. Amrani, H. Leblond and F. Sanchez, "Temporal behavior of various multi-soliton regimes generated in figure-eight all-fiber laser", *4<sup>th</sup> International Interdisciplinary Chaos Symposium on Chaos and Complex Systems, Antalya, Turquie, 29 April – 2 May 2012*. (Oral presentation).
6. F.Sanchez, M. Salhi, K. Komarov, F. Amrani and **A. Niang**, "Soliton patterns formation in fiber lasers", VI<sup>th</sup> International Conference "Solitons, Collapses and Turbulence: Achievements, Developments and Perspectives", Novosibirsk, Russia, June 4-8 2012. (Invited Speech).
7. **A. Niang**, *Les Doctoriales Pays de la Loire, Le Croisic, 23-28 mars 2014*. (Poster presentation)
8. Khmais Guesmi, Yichang Meng, **A. Niang**, Paul Mouchel, M. Salhi, Faouzi Bahloul et F. Sanchez, " Laser à fibre erbium émettant à 1600 nm. Fonctionnement continu et verrouillage en phase ", *Journées Nationales d'Optique Guidée (JNOG), Nice, 28-31 Octobre 2014*. (Poster presentation).
9. **A. Niang**, F. Amrani, M. Salhi, F. Sanchez, « L'effet d'une composante continue externe sur le comportement des solitons dans un laser à fibre verrouillé en phase », *Journées scientifiques de l'Ecole Doctorale 3MPL (JED\_3MPL), Angers, 24-25 Juin 2013*. (Oral presentation).
10. **A. Niang**, F. Amrani, M. Salhi, F. Sanchez, « Pluie de solitons dans un laser à fibre co-dopée Er-Yb en forme de huit », *Journées Nationales d'Optique Guidée (JNOG), Université Paris 13- Villetaneuse, 08-11 Juillet 2013*. (Poster).
11. **A. Niang**, F. Amrani, M. Salhi, H. Leblond, F. Sanchez, « Démonstration expérimentale du blocage passif de modes harmonique de cristaux de solitons », *Journées Nationales d'Optique Guidée (JNOG), Lyon, 10-12 Juillet 2012*. (Oral presentation)
12. **A. Niang**, F. Amrani, M. Salhi, H. Leblond, et F. Sanchez, " Démonstration expérimentale du blocage passif de modes harmonique de cristaux de solitons ", *Journées scientifiques de l'Ecole Doctorale 3MPL, Nantes, 20-21 Juin 2012*. (Poster presentation).
13. **A. Niang**, F. Amrani, M. Salhi, H. Leblond, F. Sanchez, « Mise en évidence de l'universalité des régimes multi-impulsionnels dans les lasers à fibre », *Journée des Phénomènes Ultra-rapides (JPU), Rouen, 17-20 Octobre 2011*. (Oral presentation).