

CURRICULUM VITAE  
FORMATO EUROPEO / EUROPEAN FORMAT

**PERSONAL INFORMATION**

Name  
Address  
Telephone  
Fax  
E-mail  
  
Nationality  
Date of birth

**WASYHUN ASEFA GEMECHU**

**ESPERIENZA PROFESSIONALE/  
WORK EXPERIENCE**

- Dates (from – to)
- Name and address of employer
  - Type of business or sector
- Occupation or position held
- Main activities and responsibilities

**From 2019 to 2023:** *Università degli Studi di Brescia, Piazza del Mercato, 15, 25121 Brescia BS, Italia, Public Education, Assegno di ricerca, Research on Second-harmonic generation (SHG) in optical fibers*

**From 2020 to 2021:** *Ethiopian Space Science and Technology Institute (ESSTI), Addis Ababa, Ethiopia, Research Institute, Teaching and Research in communication satellite design.*

**From 2009 to 2011:** *Bahir Dar University, Bahir Dar, Ethiopia, Public Education, Assistant Lecturer, Teaching fundamentals in electrical engineering.*

**2008:** *GCS Ethiopia, Addis Ababa, Ethiopia, Graduating internship, research in network design and server management.*

**2007:** *EthioTelecom, Addis Ababa, Ethiopia, Graduating internship, research in Mobile and wireless communication networks.*

**ISTRUZIONE E FORMAZIONE /  
EDUCATION AND TRAINING**

- Dates (from – to)
- Name and type of organisation providing education and training
- Principal subjects/occupational skills covered
  - Title of qualification awarded
- Level in national classification (if appropriate)

**Dal 2015 al 2018:** *Università degli Studi di Brescia, Brescia, Italy, Ph.D. in Information engineering*

**Dal 2015 al 2018:** *Université Paris-Saclay, Telecom Paris-tech, Paris, France, Ph.D. in Networks, Information and communications*

**Dal 2011 al 2015:** *Università degli Studi di Brescia, Brescia, Italy, M.Sc. in Telecommunication engineering*

**Dal 2005 al 2009:** *Hawassa University, Hawassa, Ethiopia, B. Sc. in Electrical engineering*

**PERSONAL SKILLS  
AND COMPETENCES**

MOTHER TONGUE

AMHARIC

OTHER LANGUAGES

- Reading skills
- Writing skills
- Verbal skills

ENGLISH [IELTS 7/9]

EXCELLENT

EXCELLENT

EXCELLENT

**SOCIAL SKILLS  
AND COMPETENCES**

FRIENDLY, COLLABORATIVE, CURIOUS, AND DEDICATED.

Traveler, enthusiastic Hiker, Scientific literacy in Astronomy & Physical Cosmology, an avid follower of SpaceX & NASA missions, Sci-Fi, World history and culture, Football, and Volleyball.

**ATTIVITA' DI RICERCA /  
RESEARCH ACTIVITIES.**

BUILDING FREE-SPACE FIBER COUPLING AND OPTICAL FIBER COMMUNICATION EXPERIMENTAL SETUP AND MEASURING SPECTRAL, TEMPORAL, AND SPATIAL PROFILES.

NUMERICAL PULSE PROPAGATION SIMULATION IN OPTICAL FIBER (NLSE, GNLSE).

MATLAB, COMSOL, PYTHON, ORIGINPRO, MS OFFICE SUITE, LATEX

**ARTISTIC SKILLS  
AND COMPETENCES**

Photography & Astrophotography,

**PUBBLICAZIONI/ BOOKS  
AND ARTICLES**

1. **Wasyhun A. Gemechu**, Mengdi Song, Y. Jaou"en, Stefan Wabnitz, and Mansoor I. Yousefi, "Comparison of the Nonlinear Frequency Division Multiplexing and OFDM in Experiment," in 43rd European Conference on Optical Communications (ECOC) (2017), paper W.3.C.4.
2. Tao Gui, **Wasyhun A. Gemechu**, Jan-Willem Goossens, Mengdi Song, Stefan Wabnitz, Hartmut Hafermann, Alan Pak Tao Lau, Mansoor I. Yousefi, and Yves Jaou"en "Polarization-Division-Multiplexed Nonlinear Frequency Division Multiplexing." CLEO-US (2018) [invited paper].
3. **Wasyhun A. Gemechu**, Tao Gui, Jan-Willem Goossens, Mengdi Song, Stefan Wabnitz, Hartmut Hafermann, Alan Pak Tao Lau, Mansoor I. Yousefi, and Yves Jaou"en "Dual Polarization Nonlinear Frequency Division Multiplexing Transmission," PTL (2018).
4. **Wasyhun Asefa Gemechu**, Umberto Minoni, Daniele Modotto, Alessandro Tonello, and Vincent Couderc "Second Harmonic Generation in Spliced Poled Fibers," CLEO-EU (2021).
5. **Wasyhun Asefa Gemechu**, Umberto Minoni, Daniele Modotto, Alessandro Tonello, and Vincent Couderc "Polarization dependent second-harmonic generation in cascaded optically poled fibers," Photorefractive Photonics and Beyond 2022 (PR'22), Monastier di Treviso, Italy.
6. **Wasyhun Asefa Gemechu**, Umberto Minoni, Daniele Modotto, Alessandro Tonello, and Vincent Couderc "Efficient second harmonic generation through cascaded optically poled fibers", *Optics Letters*, Vol. 48, No.3, (2023).

# Wasyhun Asefa Gemechu

## EDUCATION

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- 2019-2020 **Università degli Studi di Brescia, Brescia, Italy**  
2021-2023 **Position: Postdoctoral Researcher**  
Research subject: “*Second-harmonic generation (SHG) in optical fibers.*”  
Supervisors: Prof. Umberto MINONI, Prof. Daniele MODOTTO
- 2015-2019 **Università degli Studi di Brescia, Brescia, Italy**  
PhD, Information engineering. April 01, 2019.  
**Telecom Paristech, Paris, France**  
PhD, Communication & Electronics. April 01, 2019.  
**Dissertation:** “*Comparison of Nonlinear Frequency Division Multiplexing and OFDM for Optical fiber transmissions.*”  
**Supervisor:** Prof. Stefan WABNITZ, Prof. Costantino DE ANGELIS (UniBs)  
Prof. Yves JAOUËN, Dr. Mansoor I. YOUSEFI (TPT)
- 2011-2015 **Università degli Studi di Brescia, Brescia, Italy**  
MSc, Telecommunication engineering. March 18, 2015.  
**Thesis:** “Nonlinearity Compensation for Long-haul OFDM Transmission.”  
**Supervisor:** Prof. Stefan WABNITZ, Prof. Costantino DE ANGELIS
- 2005-2009 **Hawassa University, Hawassa, Ethiopia**  
BSc, Electrical engineering. July 15, 2009.  
Thesis: “Unified Communication Design for Hawassa University”  
Courses followed mathematics, physics, Communication, Electronics, etc.

## RESEARCH AND TEACHING INTERESTS

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- Linear and Nonlinear Optics, Fiber Lasers, supercontinuum generation, Solitons and extreme nonlinear waves in optical fibers, and Spatiotemporal dynamics in MMF.
- Quantum mechanics, quantum optics, and quantum computing.
- Material and semiconductor physics.
- Imaging and Asto-optical devices
- Physics-driven Machine learning and Machine learning for Nonlinear Optics

## **PUBLICATION**

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1. **Wasyhun A. Gemechu**, Mengdi Song, Y. Jaou"en, Stefan Wabnitz, and Mansoor I. Yousefi, "*Comparison of the Nonlinear Frequency Division Multiplexing and OFDM in Experiment*," in 43rd European Conference on Optical Communications (ECOC) (2017), paper W.3.C.4.
2. Tao Gui, **Wasyhun A. Gemechu**, Jan-Willem Goossens, Mengdi Song, Stefan Wabnitz, Hartmut Hafermann, Alan Pak Tao Lau, Mansoor I. Yousefi, and Yves Jaou"en "*Polarization-Division-Multiplexed Nonlinear Frequency Division Multiplexing*," CLEO-US (2018) [invited paper].
3. **Wasyhun A. Gemechu**, Tao Gui, Jan-Willem Goossens, Mengdi Song, Stefan Wabnitz, Hartmut Hafermann, Alan Pak Tao Lau, Mansoor I. Yousefi, and Yves Jaou"en "*Dual Polarization Nonlinear Frequency Division Multiplexing Transmission*," PTL (2018).
4. Wasyhun Asefa Gemechu, Umberto Minoni, Daniele Modotto, Alessandro Tonello, and Vincent Couderc "*Second Harmonic Generation in Spliced Poled Fibers*," CLEO-EU (2021).
5. Wasyhun Asefa Gemechu, Umberto Minoni, Daniele Modotto, Alessandro Tonello, and Vincent Couderc "*Polarization dependent second-harmonic generation in cascaded optically poled fibers*," Photorefractive Photonics and Beyond 2022 (PR'22), Monastier di Treviso, Italy.
6. Wasyhun Asefa Gemechu, Umberto Minoni, Daniele Modotto, Alessandro Tonello, and Vincent Couderc "*Efficient second harmonic generation through cascaded optically poled fibers*", *Optics Letters* (2023).
7. Wasyhun Asefa Gemechu, Umberto Minoni, Daniele Modotto, Alessandro Tonello, and Vincent Couderc "*Survey of efficient second harmonic generation in commercial single mode germanium-doped fibers*", [under preparation]

## **PRESENTATIONS**

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"*Experimental Demonstration of Single and Dual-Polarization NFDM in Normal Dispersion Fiber*", Università di Firenze Dipartimento di Matematica e Informatica "Ulisse Dini" Firenze, Italy, February 21st 2018

"*Experimental Demonstration of NFDM Transmission in Normal Dispersion Fiber*", University of Brescia, Department of information engineering, December 20, 2016/2017/2018.

## **EXHIBITIONS**

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Telecom ParisTech, Poster presentation and laboratory visit.

## PROFESSIONAL EXPERIENCES

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**Post-Doc work** (01/07/2019 to 30/04/2023)  
**Università di Brescia** Brescia (Italy)

Description: *We performed experimental work demonstrating second-harmonic generation in germanium-doped silica commercial fibers. Our study explores Ge-doped commercial fibers such as Corning HI980, Thorlabs 980HP, and others to demonstrate SHG capability. Furthermore, our idea of splicing poled short fiber segment has led to increased SHG efficiency. The study will be amalgamated with numerical simulation in Comsol and Matlab to characterize the fiber modes and the pulse evolution using coupled nonlinear Schrodinger equation (CNLSE).*

**PhD work** (30/11/2015 to 01/04/2019)  
**Telecom Paristech, Università di Brescia** Paris (France)

Description: *Study long-haul optical transmission using nonlinear frequency division multiplexing (NFDM) based on nonlinear Fourier transform (NFT) and OFDM. The objective of the Ph.D. work is to increase the transmission bit rate and demonstrate transmission performance gain by the NFDM as an intrinsic nonlinear compensation method compared to the OFDM through numerical simulation and experimental implementation.*

**Graduating internship** (01/07/2008 – 31/09/2008)  
**GCS Ethiopia** Addis Ababa (Ethiopia)

Description: *Study and design a 3-layer cisco campus network using Cisco products and Microsoft servers. In addition, I participated in designing, configuring, and implementing Hawassa University's five-campus WAN network with an optical fiber backbone.*

**Technician internship** (01/07/2007 – 30/08/2007)  
**ETV, Ethiopia** Addis Ababa (Ethiopia)

Description: *Study the television transmission schemes and equipment in the VHF and UHF bands.*

**Worker internship** (01/07/2006 – 31/07/2006)  
**Ethio-Telecom** Nazareth (Ethiopia)

Description: *Study GSM mobile transmission scheme.*

## LANGUAGES and INFORMATIC

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Amharic: Native speaker

English: Fluent, IELTS 7.0/9.0

Informatics: MS Office package, data processing (Matlab, Python, OriginPro, C++ basics), and COMSOL.

## SCHOLARSHIP

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Aston University, Marie Skłodowska-Curie Actions	2020-2021.
Università di Brescia PhD study scholarship	2015-2018.
Università di Brescia M.Sc. study scholarship	2011-2014.

## **Teaching Experience**

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**Lecturer** (01/04/2021-06/11/2021)  
**Ethiopian Space Science and Technology Institute (ESSTI) Addis Ababa (Ethiopia)**

Antenna and Wireless Laboratory uRAD tutorial manual (05/05/2020)  
**Università degli Studi di Brescia, Brescia, Italy**

**Assistant Lecturer** (01/09/2009 – 31/08/2011)  
**Bahir Dar University, Bahir Dar (Ethiopia)**

## **Interests & sports**

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Music and musical instruments, Photography & Astrophotography, Travel, Hiking,  
Astronomy & Physical Cosmology, SpaceX & NASA missions, Sci-Fi, Culture,  
Coursera, Football, Volleyball

## **References:**

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### **Prof. Stefan Wabnitz**

Dipartimento di Ingegneria dell'Informazione, Elettronica e Telecomunicazioni,

Università La Sapienza, Via Eudossiana 18, 00184 Roma

email: [s](mailto:stefan.wabnitz@uniroma1.it)

### **Prof. Daniele MODOTTO**

Università degli Studi di Brescia, Dipartimento Ingegneria Informazione, via Branze, 38 -  
25123 Brescia, Italia

Email: [/](mailto:daniele.modotto@unibrescia.it)

### **Prof. Umberto MINONI**

Università degli Studi di Brescia, Dipartimento Ingegneria Informazione, via Branze, 38 -  
25123 Brescia, Italia

Email: [?](mailto:umberto.minoni@unibrescia.it)

### **Prof. Yves Jaouen**

Télécom Paris, Institut Polytechnique de Paris

Email: [yv](mailto:yves.jaouen@telecom-paris.fr)

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