Curriculum Vitae

Dr. Noureddine CHAABEN

Associate Professor
Director of Research Laboratory on Heteroepitaxy and Applications (URHEA),
Faculty of Sciences, Departement of Physics,
University of Monastir
5019, Monastir, Tunisia

• Personal information

Birth place & date :	Sidi Bouzid - 05/03/1976
Nationality :	Tunisian
Current employment :	Associate professor in physics
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Linguistic Expertise :	Arabic/French/English

• Research interest

- MOVPE growth of thin films III-Nitrides semiconductors
- Caracterizations of semiconductors materials
- Optoelectronic devices for energy and optic communication
- Photovoltaic

• Education

2016 **Academic HDR Degree**

Research Unit on Heteroepitaxy and Applications (URHEA), Departement of Physics, Faculty of Sciences, University of Monastir, Tunisia

HDR Title: Gallium Nitride and its alloys: growth mode and thermal stability

2007	**Ph.D Degree in Physics** Research Unit on Heteroepitaxy and Applications (URHEA), Departement of Physics, Faculty of Sciences, University of Monastir, Tunisia - **Thesis Title:**Growth of Nitrides (AlN, GaN) on Silicon substrate by Metal Organic Vapor Phase Epitaxy (MOVPE)
2001	**Master Degree in Material and Electronic Devices** Research Unit on Heteroepitaxy and Applications (URHEA), Departement of Physics, Faculty of Sciences, University of Monastir, Tunisia - **Master Title:** Study of GaN growth on porous silicon substrate by Metal Organic Vapor Phase Epitaxy (MOVPE)
1999	**Bachelor Degree in Fundamental Physics of Solids** Faculty of Sciences, University of Monastir
1994	**Baccalaureate Degree in Mathematics** Secondary School, Sidi Bouzid, Tunisia

- ## Professional experience

2001-2005	**Contractual Assistant** in physics at Higher Institute of Biotechnology, University of Monastir, Tunisia
2005-2008	**Assistant** in physics at Faculty of Sciences, University of Monastir, Tunisia
2008-2017	**Assistant Professor** in physics at Faculty of Sciences, University of Monastir, Tunisia
SINCE 2017	**Associate Professor** in physics at Faculty of Sciences, University of Monastir, Tunisia
Tasks and responsibilities	- Teaching courses of General physics (optics, electrostatic, magnetostatic, electrokinetic, mechanics and thermodynamics). - Teaching courses of atomic physics, solid physics, optoelectronic devices, photovoltaic, optic communication. - Responsible for the physics and photovoltaic laboratories - Supervision of study project

- **Personal skills and competences**

  - MOVPE growth of III-V semiconductors
  - Heteroepitaxy of cubic III-Nitrides on (11n) surface
  - Decomposition of III-Nitrides for nanotechnology
  - Photovoltaic: devices, installations and solar textile

- **Positions HELD**

- Director of Research Laboratory on Heteroepitaxy and Applications (LRHEA), since 2020.
- Director of Common Service Unit (USCR MOVPE), since 2018.
- Member of the University Council, 2017-2020.
- Member of the Faculty Council, 2020-2023
- Member of the Tunisian Physical Association (STP-center office), since 2017.

- **Supervising**

- **PhD Supervising**

- **Chokri Saidi** (co-supervision, defended 21/12/2013)

  Growth by EPVOM and study of physical properties of diluated alloys GaN : (Sc/Bi).

- **Jihed Laifi** (co-supervision, defended 21/07/2016)

  Growth and caracterizations of III-Nitrides on oriented (001) and (11n) GaAs substrates.

- **Houda Bouazizi** (co-supervision, defended 08/09/2016)

  Study of thermal treatements effects on the properties of III-Nitrides.

- **Wafa Malek** (supervision, defended 04/01/ 2023)

  Thermal and chemical treatements of III-V materials : Kinetic and analysis.

- **Imen Daldoul** (supervision, in progress since 2017)

  Growth by MOVPE and structural and optical characterizations of GaN on GaAs (110) substrate.

- **Faiza Yahia** (supervision, in progress since 2017)

  MOVPE growth optimisation of non-polar and semi-polar GaN.

- **Nada Souawda** (supervision, in progress since 2018)

  Growth by MOVPE of cubic GaN on GaAs(11n) substrates

- **Master Supervising**

- **Houda Bouazizi** (defended 20/07/ 2011)

  Study of thermal decomposition of GaN and AlGaN

- **Ramzi Lefi** (defended 22/10/2012)

  Study of in situ time-reflectance of GaN grown by MOVPE

- **Imen Daldoul** (defended 28/10/2016)

Study of GaN growth on GaAs(110) substrate by MOVPE.

- **Faiza Yahia** (defended 05/12/2017)

  Study of GaN properties grown by MOVPE on GaAs(113) substrate.

- **Anoir Hamdi (**defended 30/11/2018)

  Study of the early stages of GaN growth by MOVPE on r-Al_2O_3 substrate.

• Publications in Referred Academic Journals

1. GaN growth on porous silicon by MOVPE, T. Boufaden, **N. Chaaben**, M. Christophersen, B. El Jani, Microelectronics Journal, 34, 843 - 848 (2003).

2. Structural and optical characterization of GaN grown on porous silicon substrate by MOVPE, **N. Chaaben**, T. Boufaden, M. Christophersen, B. El Jani, Microelectronics Journal, 35, 891- 895 (2004).

3. High resolution X-ray diffraction of GaN grown on Si(111) by MOVPE, **N. Chaaben**, T. Boufaden, A. Fouzri, B. El Jani, Journal of Applied Surface Science, 253, 241-245 (2006).

4. Morphological properties of AlN and GaN grown by MOVPE on porous Si(111) and Si(111) substrates, **N. Chaaben**, J. Yahyaoui, M. Christophersen, T.Boufaden, B. El Jani,

5. On the use of the thermal step method as a tool for study of space charge in semiconductor gallium nitride: GaN, M. S. Bergaoui, A. Matoussi, **N. Chaaben**, S. Guermazi, A. Toureille, B. El Jani, Phys stat Sol (c), No. 1, 212 - 215 (2007).

6. Simulation of in situ reflectance-time during MOVPE of GaN on sapphire substrate, **N. Chaaben**, H. Bouazizi, C. Saidi, A. Bchetnia, B. El Jani, Superlattices and Microstructures, 64, 518-534 (2013).

7. Growth of scandium doped GaN by MOVPE, C. Saidi, **N. Chaaben**, A. Bchetnia, A. Fouzri, N. Sakly, B. El Jani, Superlattices and Microstructures, 60, 120–128 (2013).

8. Effet of thin gold interlayer on the electrical and dielectrical behaviors of ITO/MEH-PPV/Al structures, O. Dhibi, A. Ltaief, **N. Chaaben** and A. Bouazizi. Microelectronics Engineering, 129, 24-30 (2014).

9. Charge transfer properties in PVK:PcH_2:C343:C_{60}/π-Si hybrid nanocomposites for photovoltaics, R. Bkakri, A. Ltaief, N. Chehata, **N. Chaaben**, F. Saidi and A. Bouazizi, Vaccum 104, 33-40 (2014).

10. Effect of TMBi supply on low-temperature MOVPE growth behavior of GaN, C. Saidi, **N. Chaaben**, J. Laifi, T. Sekrafi, O. Tottereau, A. Bchetnia, B. El Jani, J. Alloys and compounds, 625, 271-276 (2015).

11. Investigations of in-situ reflectance of GaN layers grown by MOVPE on GaAs (001), J. Laifi, **N. Chaaben**, H. Bouazizi, N. Fourati, C. Zerrouki, Y. El Gmili A. Bchetnia, J. P. Salvestrini, B. El Jani,

Superlattices and Microstructures, 86, 472–482 (2015).

12. Study of Al diffusion in GaN during metal organic chemical vapor deposition of AlGaN/GaN and AlN/GaN structures, **N. Chaaben**, J. Laifi, H. Bouazizi, C. Saidi, A. Bchetnia, B. El Jani. Materials Science in Semiconductor Processing, 42, 359–363 (2016).

13. Effect of GaAs substrate orientation on the growth kinetic of GaN layer grown by MOVPE, J. Laifi, **N. Chaaben**, H. Bouazizi, N. Fourati, C. Zerrouki, Y. El Gmili, A. Bchetnia, J.P. Salvestrini, B. El Jani, Superlattices and Microstructures, 94, 30–38 (2016).

14. Study of the partial decomposition of GaN layers grown by MOVPE with different coalescence degree, H. Bouazizi, **N. Chaaben**, Y. El Gmili, A. Bchetnia, J. P. Salvestrini, B. El Jani, Journal of Crystal Growth, 434, 72–76 (2016).

15. Study of cubic GaN clusters in hexagonal GaN layers and their dependence with the growth temperature, J Laifi, **N Chaaben**, Y El Gmili, JP Salvestrini, A Bchetnia, B El Jani, Vacuum 138, 8-14 (2017).

16. Observation of the early stages of GaN thermal decomposition at 1200 °C under N_2, H Bouazizi, M Bouzidi, **N Chaaben**, Y El Gmili, JP Salvestrini, A Bchetnia, Materials Science and Engineering: B 227, 16-21(2018).

17. Role of the TMG flow rate on the GaN layer properties grown by MOVPE on (hkl) GaAs substrates, J Laifi, C Saidi, **N Chaaben**, A Bchetnia, Y El Gmili, JP Salvestrini, Materials Science in Semiconductor Processing, 253-261 (2019).

18. Correlation of structural and optical properties of AlGaN films grown on SiN-treated sapphire by MOVPE, Bouzidi, M., Alshammari, A.S., Soltani, S., Chaaben, N., Shakfa, M.K. Materials Science and Engineering B: Solid-State Materials for Advanced Technology, 263, 114866 (2021).

19. 2,4-Bis(arylethynyl)-9-chloro-5,6,7,8-tetrahydroacridines: Synthesis and photophysical properties, Tka, N., Ayed, M.A.H., Braiek, M.B., ...Jopp, S., Langer, P. Beilstein Journal of Organic Chemistry, 17, pp. 1629–1640 (2021).

20. Growth and characterization of cubic GaN grown on GaAs (110) substrate by MOVPE, Daldoul, I., Othmani, S., Mballo, A., ...Salvestrini, J.P., Chaaben, N. Materials Science in Semiconductor Processing, 132, 105909 (2021).

21. Optical characterization by photoreflectance of GaN after its partial thermal decomposition, Malek, W., Kahouli, A., Bouzidi, M., ...Salvestrini, J.P., Rebey, A.Optik, 248, 168070 (2021).

22. Fast and effective catalytic degradation of an organic dye by eco-friendly capped ZnS and Mn-doped ZnS nanocrystals, Ouni, S., Mohamed, N.B.H., Chaaben, N., Bonilla-Petriciolet, A., Haouari, M. Environmental Science and Pollution Research, 29(22), pp. 33474–33494 (2022).

23. In situ spectral reflectance analysis of the early stages of GaN thermal decomposition Malek, W., Bouzidi, M., Chaaben, N., Alshammari, A.S., Rebey, A.*Optik*, 265, 169491 (2022).

24. Downconversion mechanism in Er^{3+}/Yb^{3+} codoped fluorotellurite glasses to enhance the efficiency of c-Si PV cells Bouzidi, M., Maaoui, A., Chaaben, N., ...Khan, Z.R., Mohamed, M. *Journal of Non-Crystalline Solids*, 595, 121837 (2022).

25. Effects of the diameter of thermally generated nanopits on carrier dynamics in AlGaN/GaN heterostructures, M Bouzidi, W Malek, N Chaaben, AS Alshammari, ZR Khan, M Gandouzi, ...Optical Engineering 61 (10), 105106 (2022).

26. Statistical physics analysis of adsorption isotherms and photocatalysis activity of MPA coated $CuInS_2$/ZnS nanocrystals for the removal of methyl blue from wastewaters, Bel Haj Mohamed Naim, Bouzidi Mohamed, Ouni Sabri, Alshammari Abdullah S,Khan, Ziaul R, Gandouzi Mohamed, Mohamed Mansour, Chaaben Noureddine, Bonilla-Petriciolet Adrian and Haouari Mohamed. *Inorganic Chemistry Communications*, 144, 109933 (2023).

• Presentations

1. Optical characterization of GaN grown on porous silicon substrate by MOVPE, **N. Chaaben**, T. Boufaden, M. Christophersen, B. El Jani, VII^{ème} Colloque National de Recherche en Physique, Hammamet-Tunisia, December 21-24 (2003).

2. MOVPE of GaN on porous silicon with AlN intermediate layer, **N. Chaaben**, T. Boufaden, M. Christophersen, B. El Jani, 5th Edward A Bouchet International Conference on Physics and high Technology, Hammamet-Tunisia, Auguste 11-15 (2003).

3. Theoretical spectral response of n-GaN/p-Si based solar cell, **N. Chaaben**, T. Boufaden, B. El Jani, International Congress on the Renewable Energies and the Environment, Sousse-Tunisia, 24-26 Mars (2005).

4. High resolution X-ray diffraction of GaN grown on Si(111) by MOVPE, **N. Chaaben**, T. Boufaden, A. Fouzri, B. El Jani, E-MRS Spring Meeting, Strasbourg, May 31-June 3 (2005).

5. Morphological properties of AlN and GaN grown by MOVPE on porous Si(111) and Si(111) substrates, **N. Chaaben**, J. Yahyaoui, M. Christophersen, T.Boufaden, B. El Jani, E-MRS Spring

Meeting, Nice-France, May 31-June 3 (2006).

6. Study of the thermal step method current signal of porous silicon, M. S. Bergaoui, **N. Chaaben**, S. Guemazi, B. El Jani, S. Angel and Toureille. The 2nd International Spectroscopy Conference, Sousse Tunisia, 25-28 March (2007).

7. III-Nitrides based new materials, **N. Chaaben** et B. El Jani, Congrès International Tu-MRS « Conférence Matériaux 2015 », Mahdia, Tunisia, march 22-26 (2015).

8. First study of AlGaN thermal decomposition under H_2, **N. Chaaben**, H. Bouazizi, A. Bchetnia and B. El Jani, E-MRS Spring Meeting, Lille-France, May 26-30(2014).

9. The partial decomposition study of GaN at 1200 °C under N_2, H. Bouazizi, **N. Chaaben**, A. Bchetnia and B. El Jani, E-MRS Spring Meeting, Lille-France, May 26-30 (2014).

10. Investigations of in-situ reflectance during MOVPE of GaN on GaAs (100), J. Laifi, **N. Chaaben**, H. Bouazizi, N. Fourati, C. Zerrouki, A. Bchetnia and B. El Jani, E-MRS Spring Meeting, Lille-France, May 26-30 (2014).

11. MOVPE of GaN on high-index GaAs substrates,J. Laifi, **N. Chaaben**, H. Bouazizi, C. Zerrouki, N. Fourati, A. Bchetnia and B. El Jani, E-MRS Spring Meeting, Lille-France, May 26-30 (2014).

12. Optical properties of scandium doped GaN, C. Saidi, **N. Chaaben**, A. Bchetnia, B. El Jani. International conference on innovative material and techniques (CIMT), Hammamet-Tunisia November 12-15 (2012).

13. In situ monitoring of growth and decomposition of GaN, H. Bouazizi, **N. Chaaben**, A. Bchetnia and B. El Jani, International Conference On Innovative Materials and Technique (CIMT), Hammamet-Tunisia, November 12-15 (2012).

14. Thermal decomposition study of AlGaN, H. Bouazizi, **N. Chaaben**, A. Bchetnia, T. Boufaden and B. El Jani, The Humboldt colloque on Nanoscale Science & Technology, Hammamet-Tunisia, March 17-19 (2012).

15. Scandium incorporation effects on GaN properties, C. Saidi, **N. Chaaben**, A. Bchetnia, A. Fouzri, B. El Jani, E-MRS Spring Meeting, Strasbourg-France, May 14-18 (2012).

16. In-situ monitoring of Bi doped GaN grown by MOVPE at low temperature, C. Saidi, T. Sekrafi, **N. Chaaben**, A. Bchetnia, B. El Jani, Second Euro-Mediterranean Meeting on Functionalized materials (EMM-FM) March 24-28 (2013), Hammamet-Tunisia.

17. Preliminary results on Bi doped GaN grown by MOVPE at low-temperature, C. Saidi, T. Sekrafi, **N**.

Chaaben, A. Bchetnia, B. El Jani, Second Euro-Mediterranean Meeting on Functionalized materials (EMM-FM) March 24-28 (2013), Hammamet-Tunisia.

18. Study of GaN crystalline qualities before and after thermal decomposition, H. Bouazizi, C. Saidi, **N. Chaaben**, A. Bchetnia and B. El Jani, Conférence Franco-maghrébine sur les Nanomatériaux, Sousse-Tunisia, May 2-5 (2013).

19. MOVPE growth and characterization of multilayer AlGaN/GaN hétérostructure, J. Laifi, C. Saidi, **N. Chaaben**, A. Touré, A. Bchetnia, and B. El. Jani, The second Euro-Mediterranean Meeting on Functional Materials EMM-FM 2013, Hammamet, Tunisia, 24-28 Mars (2013).

20. MOVPE Growth and Characterization of GaN on GaAs (100) and (11n)A /n = 1, 2, 3 substrates, J. Laifi, **N. Chaaben**, Y. El Gmili, J. P. Salvestrini, A. Bchetnia, and B. El Jani, International Meeting on advanced Materials, Hammamet, Tunisia, 7-9 Septembre (2015).

21. Properties of GaN grown by MOVPE on GaAs (110), I. Daldoul, **N. Chaaben**, Y. El Gmili, A. Bchetnia, J. P. Salvestrini and A. Rebey, Société Tunisienne de Physique, 22-26 Novembre (2016).

22. Characterizations of MOVPE- grown GaN layers on GaAs (110) Substrate, I. Daldoul, **N. Chaaben**, I. Guizani, Y. El Gmili A. Bchetnia,J. P. Salvestrini and A. Rebey. E-MRS 2017 - Spring Meeting, Strasbourg, France May 22 - 26, (2017).

23. Optimization of GaN growth on GaAs(11n) substrates, I. Daldoul, **N. Chaaben**, J.Laifi, Y. El Gmili, A. Bchetnia, J. P. Salvestrini and A. Rebey, Quantum africa 4, 30th of April -5th of May Tunisia (2017).

24. Optical and structural properties of GaN/GaAs (110) structures grown by MOVPE, I. Daldoul, **N. Chaaben**, Y. El Gmili, A. Bchetnia, J. P. Salvestrini and A. Rebey, 12ème Colloque National de Recherche en Physique 18-21 Mars, Hammamet, Tunisia, (2017).

25. Review of GaN thermal decomposition to achieve high density of strain-free GaN nanoparticles, N. Chaaben, W. Malek, M. Bouzidi and J. P. Salvestrini, MADICA-2022, Monastir, Tunisia.