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|  Prof. dr.  abdon atangana |  |

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| 0027786831014AtanganaA@ufs.ac.za | Institute for Groundwater StudiesFaculty of Natural and Agricultural Science, University of the Free State,9301 Bloemfontein, South Africa |
|  | Department of Medical Research, China Medical University Hospital, China Medical University, Taichung, Taiwan |

# Education

**PhD** University of the Free State, June 2013

Dissertation: “A generic assessment of waste disposal at Douala City practice, principals and uncertainties”

Prof. Dr. Joseph Francois Botha

**MSc** University of the Free State, June 2011

 Thesis: “Modeling groundwater flow within confined aquifer with fractional derivative”

 Advisor: Prof. Dr. Alain Cloot

Graduated with Cum Laude

Majored in Mathematics

**BSc** University of the Free State, June 2010

 Graduated Cum Laude

 Majored in Mathematics

# Honours and Awards

* Highly cited researcher (Mathematics) 2021
* Ranked 186 top world researchers in all fields (number 1 in mathematics) by S7 of

Stanford University 2021

* The World Academic Award of Mathematics 2020
* World Highly cited researcher (cross-fields) 2020
* Ranked 704 top world researchers in all fields (number 1 in Africa) by S7 of

Stanford University 2020

* Award of the Youngest Leading International Researcher in Fractional

Calculus 2019

* World Highly cited researchers (Mathematics) 2019
* Obada Award 2018
* African Academic of Science, Affiliate 2018-2022
* Most cited Mathematics paper in the world 2017
* African Award of Applied Mathematics 2017
* The number 1 top overall contributor to the peer review of the field of mathematics. The sentinel of science awards honoring the elite contributors to scholar peer review and editorial pursuits internationally. Recipients have demonstrated an outstanding expert commitment to protecting the integrity and accuracy of published research in their field 2017
* The number 1 top overall contributor to the peer review of the field of mathematics. The sentinel of science awards honoring the elite contributors to scholar peer review and editorial pursuits internationally. Recipients have demonstrated an outstanding expert commitment to protecting the integrity and accuracy of published research in their field
* [Top world reviewers in Physics - September 2019](https://publons.com/awards/peer-review/2019/by-field/)
* [Top world reviewers in Cross-Field - September 2019](https://publons.com/awards/peer-review/2019/by-field/)
* [Top world reviewers in Mathematics - September 2019](https://publons.com/awards/peer-review/2019/by-field/)
* [Top world reviewers in Mathematics - September 2018](https://publons.com/awards/2018/esi/?name=Abdon+Atangana&esi=6)
* [Top world reviewers in Multidisciplinary - September 2018](https://publons.com/awards/2018/esi/?name=Abdon+Atangana&esi=22)
* [Top world reviewers in Physics - September 2018](https://publons.com/awards/2018/esi/?name=Abdon+Atangana&esi=14)
* [Top reviewers for University of the Free State (Mathematics) - September 2017](https://publons.com/awards/2017/institution/?institution=7312&asjc=130)
* [Top reviewers for South Africa - September 2017](https://publons.com/awards/2017/country)
* [Top reviewers for Mathematics - September 2017](https://publons.com/awards/2017/field/?name=Abdon+Atangana&asjc=130)
* [Top world reviewers for General - September 2017](https://publons.com/awards/2017/field/?name=Abdon+Atangana&asjc=160)
* [Top world reviewers for Engineering - September 2017](https://publons.com/awards/2017/field/?name=Abdon+Atangana&asjc=190)
* [Top world reviewers for Mathematics - September 2016](https://publons.com/community/sentinels-of-science-recipients-2016/)
* [Top reviewers for South Africa - Apr 2015 to Jul 2015](https://publons.com/community/awards/history/)
* Price of the most prolific reviewer from South Africa 2015
* Best researcher at the University of Free State 2014
* Best researcher at the University of Free State 2015
* Best researcher at the University of Free State 2016
* Best researcher at the University of Free State 2016
* Claude Leon Postdoctoral awards 2014
* National Research Foundation (South Africa) Awards 2014
* Best researcher under 35 award at the University of Free State 2014
* Bursary of Merit at the Institute for Groundwater Studies for PhD University of the Free State 2011-2013
* Top 15% academic achiever at the University of the Free State 2011
* R 10000 academic bursary merit (University of the Free State) 2011
* Golden key’s member (International Award Society) 2011
* Master degree in mathematics and applied mathematics obtained with distinction 2010

**Title of Grant**

I have research experience within the field of mathematics and applications to real world

**2017**

* Deanship of Science Research at King Saud University for funding this prolific research group PRG-1437-35

**2016**

* Deanship of Science Research at King Saud University for funding this prolific research group PRG-1437-35.
* Deanship of Scientific Research at King Saud University for funding this group No [RG-1437-017](https://www.sciencedirect.com/science/article/pii/S0960077916301060#gs0001)

# Research Experience

I have research experience within the field of mathematics and applications to real world problems.

**Current Research Interest**

* Methods and application of nonlinear equations
* Fractional calculus and their applications to real world problems
* Application of partial, ordinary and fractional differential equation to groundwater problems
* Perturbation and asymptotic methods
* Iteration methods for differential equations
* Numerical method for partial differential equations
* Numerical methods for ordinary differential equations
* Analytical methods for partial differential equation
* Analytical methods for ordinary differential equation
* Integral transforms
* Groundwater flow models
* Groundwater transport models

Within the field I have introduced the following mathematical operators and numerical schemes that nowadays used in all fields of science, technology and engineering.

1. Atangana-Baleanu fractional derivative in Caputo sense
2. Atangana-Baleanu fractional derivative in Riemann-Liouville sense
3. Atangana-Baleanu fractional integral
4. Atangana derivative with memory
5. Atangana-Beta integral
6. Atangana-Sumudu transform
7. Beta derivative
8. Atangana Sumudu method
9. Atangana fractional derivative with two orders in Caputo sense
10. Atangana fractional derivative with two orders in Riemann-Liouville sense
11. Atangana-Gomez fractional differential operators with three orders in Riemann-Liouville sense
12. Atangana-Gomez fractional differential operators with three orders in Caputo sense
13. Atangana-Batogna numerical scheme
14. Fractal-fractional differential and integral operators to modeling real world problems
15. Atangana-Toufik numerical scheme for solving ordinary differential equations
16. The Trinition: A new complex set with two imaginaries parts
17. Atangana-Seda numerical scheme
18. Global differential and integral operators
19. Piecewise calculus
20. Strength number

# Teaching Experience

**University of the Free State**, South Africa May 2017 to date

**Professor**, Institute for Groundwater Studies

GEOH6815 ~ Groundwater Hydraulics

GEHR8900 ~ Masters of Science Majoring in Geohydrology (Geohydrology Dissertation)

GEHI8900  ~ Geohydrology Inter Dissertation

GEHR9100 ~ Philosophiae Doctor (Geohydrology Thesis)

GEHI9100  ~ Thesis Geohydrology Interdisciplinary

**University of the Free State**, South Africa September 2016 to May 2017

**Associate Professor**, Institute for Groundwater Studies

GEOH6815 ~ Groundwater Hydraulics

GEHR8900 ~ Masters of Science Majoring in Geohydrology (Geohydrology Dissertation)

GEHI8900  ~ Geohydrology Inter Dissertation

GEHR9100 ~ Philosophiae Doctor (Geohydrology Thesis)

GEHI9100  ~ Thesis Geohydrology Interdisciplinary

**University of the Free State**, South Africa December 2015 to September 2016

**Senior researcher**, Institute for Groundwater Studies

GEOH6815 ~ Groundwater Hydraulics

GEHR8900 ~ Masters of Science Majoring in Geohydrology (Geohydrology Dissertation)

GEHI8900  ~ Geohydrology Inter Dissertation

GEHR9100 ~ Philosophiae Doctor (Geohydrology Thesis)

GEHI9100  ~ Thesis Geohydrology Interdisciplinary

**Postdoctoral Students**

1. Dr. Kolade Owolabi Matthew (2017-2020)

2. Dr. Ahokpossi Pacome (2017-2019)

3. Dr. Trevor Chiweshe (2018-2022)

4. Dr. Sania Qureshi (2019-2021)

5. Dr. Muhammad Bilal Riaz (2019-2021)

6. Dr. Muhammad Altaf Khan (2019-2021)

7. Dr. Kashif Ali Abro (2019-2021)

**Doctoral Students Advised**

Ahokpossi Pacome UFS 2017

Nitchionia Batonia Rodrigue, “ 2018

Amy Jane Allwright, 2019

Rendani Vele Makahane, 2020

Mmanthupi Amanda Ramotsho, 2020

Mashudu Clifford Mathobo, 2020

Mpafane Deyi, 2020

**Co-supervisor**

Nitchionia Batonia Rodrigue “Fractional Advection Dispersion Equation”, University of the Free State, 2013. Master thesis Co-supervisor (**Completed**)

Ogouma I. “Applications of fractional derivative in image processing” University of the Free State, 2013. Master thesis, Co-supervisor (**Completed**)

**Masters Students Advised**

**2016**

Sedrick Kameni Ngwamou, African Institute of Mathematics and Statistics,

Pierre Aime Feulefack, , African Institute of Mathematics and Statistics,

**2017**

Jescica M. Spannenberg, University of the Free State

 2018

Mashudu C. Mathobo, University of the Free State

Ramotsho Amanda Mmanthupi, University of the Free State

Rendani Vele Makahane, University of the Free State

Hangwalani Magau, University of the Free State

**2019**

Sarti N. Amakali University of the Free State

Dineo Ramakatsa, University of the Free State

Palesa Myoko, University of the Free State

Awondo Magigi, University of the Free State

Tshanduko Mutandanyi, University of the Free State

Hans Tah Mbah, University of the Free State

Mohau Mahantane, University of the Free State

 2020

MORAKALADI Makosha Charlotte, University of the Free State

Disebo Chaka

MWETULUNDILA Lea Asteria, University of the Free State

Mahatima Gandi Khoza, University of the Free State

  **2021**

Siphokazi **Manundu,** University of the Free State

MABOTJA Phuti, University of the Free State

# other work Experience

Academic head of Department from 2018 to Date

* Distinguished visiting professor China medical University, 2020-2021
* Professor Institute for Groundwater Studies 2017
* Associate Professor Institute for Groundwater Studies 2016
* Appointed (Senior researcher), Institute for Groundwater Studies 2015
* Postdoctoral fellow (Researcher) University of the Free State 2013 -2015
* Part time lecturer (Mathematics) at the Central University of Technology South Africa

 2010-2012

* Tutor winter school May (Central University of Technology Bloem) 2011
* Assessor in the department of teacher education at Central university of technology South Africa 2011
* Assistant lecturer at the department of mathematics and applied mathematics (UFS)

 2010-2011

# Publications

**H-index:**

Google 63, Scopus 51, Web of Science 51.

**Citation since 2013: 15070**

## Books

Abdon Atangana, Local derivative with new parameter: Theory, methods and applications, ISBN 978-0-08-100644-3, Academic press, Elsevier, 2016

Abdon Atangana, Recent trend of fractional operators and their application in Geo-hydrology ebook ISBN: 9780128097960 ,Paperback ISBN: 9780128096703 ,Imprint: Academic Press, Published Date: 22nd September 2017 Page Count: 414 in Academic Press 2017

KM Owolabi, A Atangana, Local derivative with new parameter: Theory, methods and applications, Springer Series In Computational Mathematics, eBook ISBN: 978-981-15-0098-5, doi:0.1007/978-98115-0098-5 Springer, Singapore, 411, 2019

New Numerical Scheme with Newton Polynomial: Theory, Methods, and Applications: ISBN-10 : 0323854486. ISBN-13 : 978-0323854481. Academic Press, 2021

# Presentations and Invited Lectures

1. International Conference on Hydrology & Ground Water Expo, September 10-12, 2012 Hilton San Antonio Airport, USA
2. First international conference on analysis and applied mathematics, 2012
3. International conference of algebra and applied analysis, June 20-‐‑24 Istanbul 2012
4. International conference in numerical analysis and applied mathematics, Greece, Rhodes September 2013
5. 5th International Conference on Nonlinear Science and Complexity, Xi’an,China, 2014 (NSC 2014)
6. International Conference on Pure Mathematics, Applied Mathematics and Computational Methods (PMAMCM 2014)17–19 July 2014
7. International Conference On Special Functions & Applications (Icsfa-2015), (Xvth Annual Conference Of Society For Special Functions And Their Applications), September 9 - 11, 2015
8. ICNAAM 2015, 23-29 September 2015, Rodos Palace Hotel, Rhodes, Greece
9. International Conference On Mathematics And Mathematics Education (Icmme-2016) May 12-14, 2016 In Elazıg, Turkey
10. The 1st International Symposium on Computational Mathematics&Engineering Sciences, March 3-6, 2016. FSTE Errachidia, Morocco.
11. 24th International Conference On Finite Or Infinite Dimensional Complex Analysis And Applications 22-26 August 2016, Jaipur, India
12. International Conference on Special Functions & Applications (ICSFA-2015), (XVth Annual Conference of Society for Special Functions and their Applications), September 9 - 11, 2016.
13. The African Colloquium on Research in Computer Science and Applied Mathematics, Hammamet, Tunisia From 11-14 October 2016.
14. 3rd International Conference on Pure and Applied Sciences Dubai, Feb. 2-6, UAE (2017).
15. International Conference on Mathematical Methods In Engineering, 27-29 April, 2017, Ankara.
16. International Conference on Computational Mathematics and Engineering Sciences, 20-22 May, 2017, Istanbul.
17. African Days on Applied Mathematics (ADAM'2017). November 02-04 2017, Errachidia, Morocco.
18. AIMS-UB International Conference on Mathematics and Its Applications (AIMS-UB ICMA2017) . Buena, Cameroon, December 12 - 14, 2017
19. [7th International Conference on Mathematics & Information Science, ٍSohag, Egypt, 15-17 Feb. 2018](http://confs.naturalspublishing.com/)
20. The Third International Conference on Computational Mathematics and Engineering Sciences (CMES-2018) May 04 To 06, 2018 In Girne, Cyprus (Turkish Republic Of Northern Cyprus).
21. International Conference on Mathematical Modelling, Applied Analysis and Computation (ICMMAAC-18), 6-8 July 2018.
22. 6th Annual Conference of The School of Sciences, Federal University of Technology, Akure, 23-28, June (2018).
23. International Conference on Mathematical Methods in Engineering, 27-29 April, 2019, Ankara.
24. The ICMMAAC-2018 2nd International Conference on Mathematical Modeling, Applied Analysis and Computation.
25. International Conference on Mathematics and Its Applications, GC University Lahore 2018
26. International Workshop on Nonlinear Analysis and Applications, (IWNAAP-2018), UMT Lahore
27. The Third International Conference on Computational Mathematics and Engineering Sciences (CMES-2019) 20-23, 2019 Antalya.
28. International Workshop on Nonlinear Analysis and Applications, (IWNAAP-2019), UMT Lahore.
29. International Workshop on Nonlinear Analysis and Applications, (IWNAAP-2020), UMT Lahore
30. [**INTERNATIONAL SYMPOSIUM ON APPLIED MATHEMATICS AND ENGINEERING**](https://ntmsci.com/Conferences/ISAME2022), 2021
31. 3rd International **Conference** on Mathematical Modelling, Applied Analysis and Computation 2021
32. 4th International Conference on Computational Mathematics and Engineering Sciences 2021
33. Differential Equations: Analysis, Modeling and Numerical Computations DEAMN, 2021
34. International Symposium on Recent Advances in Fractional Calculus (ISRAFC 2021)
35. 4 th International Conference on Mathematical and Related Sciences 2021
36. International conference on Mathematics and mathematics education, 2021

# Professional Service

**Editorial boards**

1. Chaos Solitons and Fractal (ISI, Impact factor, 3.764)
2. Alexandria Engineering Journal (Impact Factor, 2.698) (From 2019 to 2021)
3. Results in Physics (Impact factor, 4.016)
4. Fractals Complex Geometry, Patterns, and Scaling in Nature and Society (Impact, 4.771)
5. European Journal of Physical Plus(ISI, Impact Factor, 2.604)
6. Thermal Science Journal (ISI, Impact factor, 1.52)
7. Advances in Difference Equations, (Impact Factor 2.56)
8. DCDS-S Discrete and Continuous Dynamical Systems Series S (ISI, Impact factor,1.281)
9. Open Physics (formally Central European Journal of Physic) (ISI, Impact Factor, 1.08) (Associate editor From 2014 to 2017)
10. Open Mathematics (formally Central European Journal of Mathematics) (ISI, Impact Factor, 0. 575) (Associate Editor, From 2014-2017)
11. Maejo International Journal of Science and Technology (ISI, Impact Factor, 0.378)
12. Journal of Mathematics and Computer Science (ISI)
13. International Journal of Analysis and Applications (ISI)
14. AIMS Mathematics (ISI, impact 0.87)
15. Progress in Fractional Differentiation and Application (ISI, Q1)

**Guest editor in top special issues**

1. Fuzzy Sets and Systems (lead guest editor, impact 2.98) Fractional Fuzzy Differential Equations

2. Fractal: Complex Geometry, Patterns, and Scaling in Nature and Society (Lead guest editor, impact 2. 971)

3. World Scientific Journal (ISI, impact factor 1.230) (Lead Guest Editor)

4. Mathematical problems in engineering (ISI, impact factor 0.83) (Lead Guest Editor)

5. Journal of Hydrology (Lead Guest Editor).

6. Modelling Complex Real-World Problems with Fractal and New Trends of Fractional Differentiation (Lead Guest Editor, Impact Factor, 1.753)

7. New trends in numerical methods for partial differential and integral equations with integer and non-integer order (Lead Guest Editor, Impact Factor, 1.072)

8. Mathematical Modelling of Natural Phenomena(Lead Guest Editor, Impact Factor, 0.72). Theory and applications of fractional differentiation

9. Chaos Solitons and Fractals: Applying ABC derivatives (Lead Guest Editor, Impact Factor, 3.064)

10. Chaos: Journal of nonlinear science (Lead Guest Editor, Impact Factor, 2.202)

11. DCDS-S Discrete and Continuous Dynamical Systems Series S (ISI, Impact factor, 0.781)

**Symposium Co-Organizer**

1. **Organizer and Chairman of the special session 2** with title “Partial equations and their applications” The 2014 International Conference on Pure Mathematics, Applied Mathematics and Computational Methods, Santorini Island, Greece, July 17-19, 2014.
2. **Organizer and Chairman of the symposium** with title **“Analysis of Nonlinear Differential Equations: Theory, Methods, and Applications”.** The International Conference of Numerical Analysis and Applied Mathematics, **ICNAAM 2015, 23-29 September 2015, Rodos Palace Hotel, Rhodes,** Greece.
3. **Organizer and chairman of the special section** with title **“**Trends on Fractional Operators and Their Applications**”** The International Conference “Mathematical and Computational Modelling in Science and Technology” ICMCMST’15, to be held at Izmir University, Izmir-Turkey, during August 02-07, 2015.
4. **Organizer and Chairman of special section** with title “Analysis of Fractional Differential, Integral and Difference equations with Applications”World Congress: 11th International Conference on Mathematical Problems in Engineering, Aerospace and Sciences. La Rochelle, France, July 5 - July 8, 2016.

**International Committee Members of International Conferences**

1. 24th International Conference on Finite or Infinite Dimensional Complex Analysis and Applications, 22-26 June 2016, Anand International College Of Engineering, Jaipur, India
2. The 1st International Symposium on Computational Mathematics&Engineering Sciences, March 3-6, 2016. FSTE Errachidia, Morocco.
3. International Conference on Special Functions & Applications (ICSFA-2015), (XVth Annual Conference of Society for Special Functions and their Applications), September 9 - 11, 2016.
4. International Conference on Mathematics and Mathematics Education (ICMME-2016) May 12-14, 2016, Elazığ, Turkey.
5. The International Conference, Applied Mathematics in Heat and Fluid Flows Shangjiang, Shanghai, China, During April 27-29, 2016.
6. The African Colloquium on Research in Computer Science and Applied Mathematics, Hammamet, Tunisia From 11-14 October, 2016.
7. International Conference on Mathematical Methods in Engineering, 27-29 April, 2017, Ankara.
8. International Conference on Computational Mathematics and Engineering Sciences, 20-22 May, 2017, Istanbul.
9. AIMS-UB International Conference On Mathematics And Its Applications (AIMS-UB ICMA2017) . Buena, Cameroon, December 12 - 14, 2017.
10. International Conference on Special Functions & Applications (ICSFA-2015), (Xvth Annual Conference of Society for Special Functions and Their Applications), September 9 - 11, 2016.
11. International Conference on Mathematical Methods in Engineering, 27-29 April, 2017, Ankara.
12. International Conference on Computational Mathematics and Engineering Sciences, 20-22 May, 2017, Istanbul.
13. African Days on Applied Mathematics (ADAM'2017). November 02-04 2017, Errachidia, Morocco.
14. [7th International Conference on Mathematics & Information Science, ٍSohag, Egypt, 15-17 Feb. 2018](http://confs.naturalspublishing.com/)**.**
15. The Third International Conference on Computational Mathematics and Engineering Sciences (CMES-2018) May 04 To 06, 2018 In Girne, Cyprus (Turkish Republic of Northern Cyprus).
16. The Fourth International Conference on Computational Mathematics and Engineering Sciences (CMES-2019) April 21 to 23, 2019 in Antalya, Turkey.