Curriculum Vitae

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PERSONAL INFORMATION:

Full Name: Mohammad Naghdi, Born in Ilam, Kurd-Iran, November 1980; Married, one Daughter; Academic Staff at Ilam University, Iran; E-Mail: <u>naghdi.m@gmail.com</u> (Academic E-Mail: <u>m.naghdi@ilam.ac.ir</u>) Study and Research Field: Theoretical Nuclear-Particle Physics and Gravitation, Specialization: String Theory. University Home-Page: <u>https://rms.ilam.ac.ir/profile/m.naghdi/overview?lang=En</u> Personal Home-Page (outdated): https://sites.google.com/site/astrophy001/home



EDUCATION:

- **B.Sc. in Applied Physics (Nuclear and Solid State Physics), Lorestan University**, Khoramabad, Iran, Sept. 1999 up to May. 2003.
- M.Sc. in Nuclear Physics, University of Tehran, Tehran, Iran, Sept. 03 -Sept. 05.
- Ph.D. in Elementary Particle Physics & Gravitation, Tarbiat Modares University (TMU), Tehran, Iran, Oct. 2005 up to Sept. 2011. This almost long period for Ph.D. was because I have changed three phases of studies for researches: High Energy Phenomenology and QCD; Classical Gravitation and Cosmology; and now study/research in String Theory.

Some Passed Specialist Courses:

In B.Sc.: Nuclear Physics I, II (Krane & Cohen Books), Reactor Physics I, II (Lamarsh Book), Solid State Physics (Kittle Book), Electronics (Malvino Book), Laser (no special Book).

In M.Sc.: Advanced Nuclear Physics (Samuel Wong Book), Many-Body Physics I, II (Fetter & Walecka Book).

In Ph.D.: Self-Studying the Following Books:

Elementary Particle Physics (Halzen & Martin), Quantum Field Theory (Mandel & Shaw and Peskin & Schroeder), Group Theory (Wybourne Book), General Relativity I, II (Sean Carroll & Hans Stephani Books), Cosmology (Liddle; -Ta-Pi Cheng: "Relativity, Gravitation and Cosmology"; and some parts of the books by - Coles & Lucchin; -Mukhanov: "Physical Foundation of Cosmology"), Supersymmetry and String and M-Theory (at least four books by - B. Zwiebach: "A First Course in String Theory"; - J. Wess, J. Bagger: "Supersymmetry and Supergravity"; - M. Dine: "Supersymmetry and String Theory"; - K. Becker, M. Becker, J. H. Schwarz: "String Theory and M-Theory").

- My M.Sc. Thesis was on Nucleon-Nucleon (NN) Interaction in phase of Theoretical and Computational Nuclear Physics under supervision of Dr. Majid Modarres (Professor of Theoretical Nuclear and Particle Physics) at University of Tehran.
- M.Sc. Thesis Title: "Study and Comparison of Various Nucleon-Nucleon (NN) Potential Models and Forms".
- My Ph.D. Thesis was on Non-Perturbative effects (Instantons & Solitons) in Field and String theory, in both sides of AdS/CFT Correspondence, with guiding of Dr. Ali Imaanpur (Associate Professor of Elementary Particle Physics) at TMU.
- Ph.D. Thesis Title: "Instantons and their Non-Perturbative Effects in AdS/CFT Correspondence".

RECORDS:

Work Indicators & Honor:

- Rank one Graduated Student in B.Sc. at Lorestan University (2003); Rank one Among Graduated Students in Nuclear Physics in M.Sc. at University of Tehran (2005).
- Accepted with Rank One for Ph.D. at Two Universities: Isfahan University of Technology: Nuclear Physics and Tarbiat Modares University (fully graduated university): All Branch in Physics, and awarded.

Jobs and Special Schools and Teaching:

- Invited and Participated in the excellent last year B.Sc. Students one week School at Institute for Advanced Studies in Basic Sciences (IASBS), Zanjan, Iran, (2002).
- Scholarship Student of Ministry of Science, Research and Technology (MSRT) for Ilam University from 23 Sept. 2005 to 22 Sept. 2009.
- Participating in Several National and International Physics Conferences in Iran particularly those hold at Institute for Research in Fundamental Sciences (IPM).
- A Six Month Research Period, During Ph.D., as a Visitor at "String Theory Group" of the Physics Department at University of Rome II "Tor Vergata", Rome, Italy, May-Oct. 2009- I Requested and Invited by Prof. "Massimo Bianchi".
- After graduating from Ph.D., according to the rules, I came to Ilam University to work as an Academic Staff, from Sept. 2011.
- The Courses taught at Ilam University:

Physics I (Mechanics), Physics II (Electricity and Magnetics), Analytical Mechanics (I, II), Mathematical Physics (I, II), Nuclear Physics (I, II), Elementary Particle Physics (undergraduate), Relativity's Theory (undergraduate), Nuclear and Particle Physics (undergraduate), Advanced Particle Physics I (Graduate), Gravity I (Graduate), Geometry and Topology I (Graduate), Special Topics in Physics (Graduate).

- Member of Physics Society of Iran since 2011.
- Refereeing papers for "International Journal of Theoretical Physics" and "Canadian Journal of Physics" ISI journals since 2014.
- Refereeing "Applied Research Projects" for "Science and Technology Park of Ilam".
- Member of Scientific Committee of National Physics Conference and Refereeing 15 Papers there (2016).
- **Short-Term Visitor**, High Energy, Cosmology and Astroparticle Physics (HECAP), Abdus Salam International Centre for Theoretical Physics (ICTP), Sept-Oct. 2019.
- Non-Resident Researcher, School of Particles and Accelerator, Institute for Research in Fundamental Sciences (IPM), (2021-2023).

RESEARCH INTERESTS:

All Branches of Physics, Especially:

- Theoretical Nuclear & Particle Physics, and Nuclear Structure,
- **Quantum Field Theory** (QFT, Especially Non-Perturbative QCD),
- Many-Body Systems,
- Gravitation and Cosmology (Inflationary Cosmology, Black Holes, Dark energy/matter),
- String Theory (Especially (A)dS/CFT/QCD/CMT Correspondence).

Current Researches:

• Non-Perturbative effects in gauge and gravity theories: Formal Aspects and Applications of AdS/CFT.

Talks/Lectures:

- Three Talks on QCD at Physics Department of TMU, 2008. Talk I: "Scattering Reactions, Internal Structure of Baryons, Gauge Theories and QCD"; Talk II: "Perturbative QCD (Deep Inelastic Scattering, Drell-Yan Processes, and Small-x Physics)"; Talk III: "Nonperturbative QCD (Lattice Calculations, QCD Sum Rules, and Phenomenological Models)". The lectures are prepared in Power Point.
- A Special Talk on "*Instanton in AdS*₄/*CFT*₃ *Correspondence*" at the string theory group, INFN, June 2009, Italy- Participating in the special Annual International "Strings 2009" conference there.
- Talk (invited) on "*Instantons of AdS*₄/*CFT*₃ *Duality*" at Physic Department, Sharif University of Technology, Tehran, Iran, March 10, 2015.

- Conference Talk titled: "*Non-Supersymmetric Instantons in CFT_3 from Massive and Tachyonic Pseudoscalars in AdS_4*", National Conference on Physics and Its Applications, Malayer University, Hamedan, Iran, 28 Jan (2016).
- Conference Talk titled: " Unstable Massive (pseudo)Scalars in AdS₄ with Backreaction and Dual Solutions in the Boundary U(N)/O(N)Vector Models ", The 8th National Conference on Physics, Payame Noor University (PNU), Shiraz, Iran, 10-11 May (2017).

Conference Proceedings (in Farsi):

- M. Naghdi, "An U(1) Instanton in the ABJM Model", 19th Spring Physics Conference, IPM, Tehran, Iran, 16-17 May (2012).
- M. Naghdi, "Solitons and Instantons in a Model of AdS₄/CFT₃ Correspondence", Annual Physics Conference of Iran, Yazd University, Yazd, Iran, 27-30 August (2012).
- M. Naghdi, "*Pseudo-Scalar States in AdS*₄ *from Branes Winding CP*³", 20th Spring Physics Conference, IPM, Tehran, Iran, 22-23 May (2013).
- M. Naghdi, "*Localized States in AdS*₄ *for Marginal Operators on CFT*₃", Annual Physics Conference of Iran, Birjand University, Birjand, Iran, 26-29 August (2013).
- M. Naghdi, "*Localized Objects From M-Branes over* $AdS_4 \times S^7/Z_k$ ", 22th Spring Physics Conference, IPM, Tehran, Iran, 20-21 May (2015).
- M. Naghdi, "Strong Nuclear Force: Various Models and Shapes of Nucleon-Nucleon Potential", National Conference on Physics and Its Applications, Malayer University, Hamedan, Iran, 28 Jan (2016).
- M. Naghdi, "A Model for Likening Phenomenological Nucleon-Nucleon Potentials", National Conference on Physics and Its Applications, Malayer University, Hamedan, Iran, 28 Jan (2016).
- M. Naghdi, "A Truncation of 11-Dimensional Supergravity, Massive Modes in AdS₄, SO(4) - Invariant Instantons in CFT₃ and Vacuum Instability", The 8th National Conference on Physics, Payame Noor University (PNU), Shiraz, Iran, 10-11 May (2017).
- M. Naghdi, "(pseudo)Scalars in *AdS*₄ from Membranes Wrapping *S*⁷, New Instantons in Boundary *CFT*₃'s and Bose-Fermi Duality", 27th Spring Physics Conference, IPM, Tehran, Iran, 24-25 June (2020).
- M. Naghdi, "Probe Approximation of Two Massive and Tachyonic (pseudo)Scalars in AdS₄ and Dual Solutions in Regular and Critical 3D Fermion and Boson Models",

Annual Physics Conference of Iran, Razi University, Kermanshah, Iran, 22-25 August (2020).

• M. Naghdi, "Adomian Method to Solve (pseudo)Scalar Equations in AdS₄ Space and Dual Boundary Solutions in Chern-Simon-Matter Theories", Annual Physics Conference of Iran, Razi University, Kermanshah, Iran, 22-25 August (2020).

PUBLICATIONS:

Books:

• Solutions to Questions of the Exam for entering to M.Sc. Level in Physics at Iran Universities (the Questions are from Classical Mechanics, Electromagnetism, Special Relativity & Quantum Mechanics, and English Language), Preprint (in Farsi).

Research Projects:

• The theoretical research project "*Solitary Objects in AdS Space, Holography and Applications*", at Ilam University, June 2015 (in Farsi).

Journal Papers:

- M. Naghdi, "*Nucleon-Nucleon Interaction: a Typical/Concise Review*", Phys. Part. Nucl. v. 45 N 6, (2014), (85 pages, Journal IF: 0.619), [arXiv: nucl-th/0702078].
- A. Imaanpur, M. Naghdi, "*Dual Instantons in Anti-membranes Theory*", Phys. Rev. D 83, 085025 (2011), (14 pages, Journal IF: 5.0), [arXiv: 1012.2547 [hep-th]].
- M. Naghdi, "*A Monopole Instanton-Like Effect in the ABJM Model*", Int. J. Mod. Phys. A 26, 3259 (2011), (15 pages, Journal IF: 1.799), [arXiv: 1106.0907 [hep-th]].
- M. Naghdi, "*New Instantons in AdS*₄/*CFT*₃ *from D4-Branes Wrapping Some of CP*³", Phys. Rev. D 88, 026013 (2013), (21 pages, Journal IF: 5.0), [arXiv: 1302.5294 [hep-th]].
- M. Naghdi, "*Marginal Fluctuations as Instantons on M2/D2-Branes*", Eur. Phys. J. C 74, 2826 (2014), (21 pages, Journal IF: 5.436), [arXiv: 1302.5534 [hep-th]].
- M. Naghdi, *"Comparing Some Nucleon-Nucleon Potentials"*, Phys. Part. Nucl. Lett. v. 11, N4 (2014), (33 pages, Journal IF: 0.50), [arXiv: 1306.5687 [hep-th]].
- M. Naghdi, "*Dual localized objects from M-branes over* $AdS_4 \times S^7/Z_k$ ", Class. Quant. Grav. 32, 215018 (2015), (20 pages, Journal IF: 3.50), [arXiv: 1502.03281 [hep-th]].

- M. Naghdi, "Non-Minimally Coupled Pseudoscalars in AdS_4 for Instantons in CFT_3", Class. Quant. Grav. 33, 115005 (2016(20 pages, Journal IF: 3.50), [arXiv: 1505.00179 [hep-th]].
- M. Naghdi, "Massive (pesudo)Scalars in AdS_4, SO(4) Invariant Solutions and Holography", Eur. Phys. J. Plus 133, 307 (2018), (20 pages, Journal IF: 3.40), [arXiv: 1703.02765 [hep-th]].
- M. Naghdi, "A Truncation of 11-Dimensional Supergravity for Fubini-Like Instantons in *AdS*₄/*CFT*₃", Fortschr. Phys. 1800044 (2018), (19 pages, Journal IF: 3.90), [arXiv: 1708.02530 [hep-th]].
- M. Naghdi, "Instanton Solutions in a Model of *AdS*₄/*CFT*₃Correspondence", Iran. J. Phys. Res. 20, 471 (2020). (16 pages, Journal IF: 0).
- M. Naghdi, "Instantons in AdS₄ From (anti)Membranes Wrapping S⁷ To Bose-Fermi Duality in CFT_3's", Eur. Phys. J. Plus 138, 45 (2023), (37 pages, , Journal IF: 3.40), [arXiv: 2002.06547 [hep-th]].
- M. Naghdi, "Solutions For Scalar Equations in AdS₄ with Adomian Method and Boundary CFT_3's Duals", Eur. Phys. J. Plus 138, 300 (2023), (22 pages, , Journal IF: 3.40), [arXiv: 2005.00358 [hep-th]].

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