ORCID QR code

Dr. PADMANATH MADANAGOPALAN

Platter Strasse 34, 65193 Wiesbaden, Germany . *DOB*: 18^{th} August 1985

Ph: +49-157-769-20601 . *Email*: pmadanag@uni-mainz.de / papppan@gmail.com

Fax: +49-6131-39-27079 . *Orcid ID*: 0000-0001-6877-7578

PRESENT POSITION

01/2020 - Present **Post-doctoral fellow**

Helmholtz Institut Mainz, Universität Mainz, Germany

Funding: GSI Helmholtzzentrum für Schwerionenforschung GmbH, Darmstadt

Projects: Light and strange dibaryon spectroscopy, QED effects in hadronic observables.

EDUCATION

03/2014 **Doctor of Philosophy in Physics**

Tata Institute of Fundamental Research (TIFR), Mumbai, India

Dissertation title: Baryons from lattice QCD

URL: http://theory.tifr.res.in/Research/Thesis/Padmanath_final_thesis.pdf

Thesis Advisor: Professor Nilmani Mathur

05/2008 **Master of Science in Physics**

Indian Institute of Technology, Roorkee, India

Masters Major: Atmospheric physics

Masters thesis: Quantum and classical teleportation

03/2006 **Bachelor of Science in Physics**

Government Victoria College, Palakkad, Kerala, India

Bachelors thesis: Nuclear Magnetic Resonance

RESEARCH INTERESTS

Quantum ChromoDynamics (QCD), lattice QCD, conventional and exotic hadron spectroscopy, hadronic resonances, heavy flavor physics and hadron structure.

RESEARCH EXPERIENCE

10/2016 - 12/2019 **Post-doctoral fellow**, Universität Regensburg, Germany

Exotic charmonium: Defining the problem and the scope of investigation, designing the observables (single and two-meson operators), realizing the measurement (correlation functions) and (variational) analysis codes, generating the hadron correlator data, analysis and publication [1, 2, 3].

Ground state heavy hadrons: Designing the observables (for mesons, baryons, tetraquarks and dibaryons), realizing the hadron correlator measurements and analysis codes, generating the NRQCD propagators and hadron correlator data, analysis and publication [4, 5, 6].

Excited Ω_c baryons: Constructing charmed baryon correlator data, analysis, publication and dissemination [7].

05/2016 - 08/2016 **Visiting research fellow**, TIFR, Mumbai, India

Excited hadrons: Building codes for distillation framework and generalized eigenvalue problem towards determining excited meson spectrum.

Dibaryons: Defining the problem and the scope of investigation, constructing the operators, writing codes for dibaryon correlation functions and analysis.

RESEARCH EXPERIENCE (*Continues ...*)

04/2014 - 03/2016 **Post doctoral fellow**, Universität Graz, Austria.

Excited nucleons: Defining the problem and the scope of investigation, constructing the baryon and baryon-meson operators, realizing the codes for correlation functions, analysis, publication and dissemination [8, 15].

Excited charmonium: Designing the measurement (single and two-meson) codes, building the hadron correlator data, analysis, publication and dissemination [9, 16].

Excited doubly charmed baryons: PhD Thesis related work. Building the charm baryon correlator data, analysis, publication and dissemination [10, 18].

05/2010 - 03/2014 **Graduate research fellow**, TIFR, Mumbai, India

Excited charmed baryons: Constructing the interpolator basis for singly, doubly and triply charmed baryons, building the charm baryon correlator data, analysis, publication and dissemination [11, 20].

Nucleons at finite temperature: Simulate SU(3) gauge configurations at different temperatures, realize hadron (mesons and baryons) screening correlator measurement codes, generate quark propagator and hadron correlator data, analysis and publication. [12].

Ground state hadrons: Realizing the hadron (mesons and baryons) correlator measurement codes, generating the hadron correlator data and analysis [28, 29, 30].

TEACHING AND MENTORING EXPERIENCE

10/2018 - 02/2019 **Teaching Assistant, Introductory lattice QCD**

10/2017 - 02/2018 Institut für Theoretische Physik, Universität Regensburg, Germany

04/2017 - 07/2018 **Teaching Assistant, Parallel Programming in FORTRAN and C++**

Institut für Theoretische Physik, Universität Regensburg, Germany

05/2016 - 08/2016 **Informal assistance, graduate level project**

DTP, Tata Institute of Fundamental Research, Mumbai, India

Title: Excited hadron spectroscopy using distillation on $N_f = 2 + 1 + 1$ MILC lattices.

05/2016 - 08/2016 **Informal assistance, under-graduate level project**

DTP, Tata Institute of Fundamental Research, Mumbai, India

Title: H-dibaryon spectroscopy on $N_f = 2 + 1 + 1$ MILC lattices.

08/2011 - 12/2011 **Teaching Assistant, Quantum Mechanics I**

DTP, Tata Institute of Fundamental Research, Mumbai, India

02/2010 - 06/2010 **Teaching Assistant, Numerical Analysis Course**

DTP, Tata Institute of Fundamental Research, Mumbai, India

AWARDS AND ACHIEVEMENTS

10/2017 - 12/2019 **Marie-Skłodowska-Curie Individual European Fellowship**

Funding: European Commission (Horizons 2020)

Grant period and amount: 24 months & EUR 171,460.80

11/2008 - 03/2014 **Shyama Prasad Mukherjee Fellowship** (PhD Funding; CSIR-UGC NET Dec. 2007)

Funding: Council of Scientific and Industrial Research (CSIR), India

06/2006 **Gold Medal in Physics Talent Search**

Organization: Academy of Physics Teachers, Kerala, India

06/2006 **University III rank, B. Sc. in Physics**

University: University of Calicut, India

CONFERENCE PRESENTATIONS (international *most notable*)

Plenary review talks (invited)

03/2021 **Charmonium resonances in $D\bar{D}$ scattering**
Quarkonium Working Group 2021, *UC Davis, California, US.*

12/2019 **Lattice investigation of charm and bottom hadrons**
3^{rd} Exotic hadron spectroscopy workshop, *King's Manor, York, UK.*

07/2018 **Hadron Spectroscopy and Resonances Review**
36^{th} International symposium on lattice field theory, *East Lansing, MI, US.*

11/2017 **Heavy hadron spectroscopy from the lattice**
LHCb implications workshop, *CERN, Geneva, Switzerland.*

05/2015 **Charm baryons on the lattice**
CHARM 2015, *Detroit, MI, US.*

Other review talks

09/2018 **Baryon excitations from lattice QCD**
QCD and its symmetries, *Oberwölz, Austria.*

06/2018 **Heavy baryon spectroscopy from lattice QCD**
Double charm baryons and dimesons, *Bled, Slovenia.*

Parallel talks in yearly lattice meetings

06/2017 **Nπ scattering in the Roper channel**
35^{th} International symposium on lattice field theory, *Granada, Spain.*

07/2015 **X(3872) and Y(4140) using diquark-antidiquark operators with lattice QCD**
33^{rd} International symposium on lattice field theory, *Kobe, Japan.*

06/2014 **Spectroscopy of charmed baryons from lattice QCD**
32^{nd} International symposium on lattice field theory, *Brookhaven, NY, USA.*

07/2013 **Spectroscopy of doubly and triply charmed baryons from lattice QCD**
31^{st} International symposium on lattice field theory, *Mainz, Germany.*

TECHNICAL SKILLS

Lattice packages (*Good*): MILC, QCD-chroma, OepnQCD, and ILGTI software packages
Programming languages (*Good*): F77, F90, C, C++ and Mathematica
Programming languages (*Basic knowledge*): python, Matlab
Shell scripts (*Good*): bash, csh, awk, perl
Job scheduler (*Good*): PBS, Loadleveler and Slurm

LANGUAGES

English (*Excellent*): Speaking, reading and writing
Malayalam (*Native*): Speaking, reading and writing
Hindi (*Proficient*): Speaking, reading and writing
German (*Basic*): Speaking, reading and writing
Tamil (*Basic*): Speaking

PROFESSIONAL REFERENCES

- **Prof. Nilmani Mathur** (*PhD thesis advisor*), DTP, TIFR, Mumbai, India.
  Ph.: +91-22-2278-2215 ; *Email*: nilmani@theory.tifr.res.in

- **Prof. Sasa Prelovsek**, Faculty of Mathematics and Physics, University of Ljubljana, Slovenia.
  Ph.: +386-1-477-3223 ; *Email*: sasa.prelovsek@ijs.si

- **Prof. Gunnar Bali**, Institut für Physik, Universität Regensburg, Germany.
  Ph.: +49-941-943-2017 ; *Email*: Gunnar.Bali@physik.uni-regensburg.de

- **Prof. Christian Lang**, Institut für Physik, Universität Graz, Graz, Austria.
  Ph.: +43-316-380-5246 ; *Email*: christian.lang@uni-graz.at

- **Dr. Sara Collins**, Institut für Physik, Universität Regensburg, Germany.
  Ph.: +49-941-943-2046 ; *Email*: sara.collins@physik.uni-regensburg.de

PUBLICATION LIST *InspireHEP link*

Regular publications

[1] S. Prelovsek, S. Collins, D. Mohler, M. Padmanath and S. Piemonte, [arXiv:2011.02542 [hep-lat]].

[2] S. Piemonte, S. Collins, D. Mohler, M. Padmanath and S. Prelovsek,
Phys. Rev. D **100**, no. 7, 074505 (2019) [arXiv:1905.03506 [hep-lat]]. *4 citations.*

[3] M. Padmanath, S. Collins, D. Mohler, S. Piemonte, S. Prelovsek, A. Schäfer and S. Weishäupl,
Phys. Rev. D **99**, no. 1, 014513 (2019) [arXiv:1811.04116 [hep-lat]]. *6 citations.*

[4] P. Junnarkar, N. Mathur and M. Padmanath,
Phys. Rev. D **99**, no. 3, 034507 (2019) [arXiv:1810.12285 [hep-lat]]. *24 citations.*

[5] N. Mathur and M. Padmanath,
Phys. Rev. D **99**, no. 3, 031501 (2019) [arXiv:1807.00174 [hep-lat]]. *19 citations.*

[6] N. Mathur, M. Padmanath and S. Mondal,
Phys. Rev. Lett. **121**, no. 20, 202002 (2018) [arXiv:1806.04151 [hep-lat]]. *38 citations.*

[7] M. Padmanath and N. Mathur,
Phys. Rev. Lett. **119**, no. 4, 042001 (2017) [arXiv:1704.00259 [hep-ph]]. *57 citations.*

[8] C. B. Lang, L. Leskovec, M. Padmanath and S. Prelovsek,
Phys. Rev. D **95**, no. 1, 014510 (2017) [arXiv:1610.01422 [hep-lat]]. *60 citations.*

[9] M. Padmanath, C. B. Lang and S. Prelovsek,
Phys. Rev. D **92**, no. 3, 034501 (2015) [arXiv:1503.03257 [hep-lat]]. *71 citations.*

[10] M. Padmanath, R. G. Edwards, N. Mathur and M. Peardon,
Phys. Rev. D **91**, no. 9, 094502 (2015) [arXiv:1502.01845 [hep-lat]]. *53 citations.*

[11] M. Padmanath, R. G. Edwards, N. Mathur and M. Peardon,
Phys. Rev. D **90**, no. 7, 074504 (2014) [arXiv:1307.7022 [hep-lat]]. *47 citations.*

[12] S. Datta, S. Gupta, M. Padmanath, J. Maiti and N. Mathur,
JHEP **1302**, 145 (2013) [arXiv:1212.2927 [hep-lat]]. *20 citations.*

Conference proceedings (self presented)

[13] M. Padmanath, *Proceedings of Bled workshop 2018*, arXiv:1905.10168 [hep-lat].

[14] M. Padmanath, PoS LATTICE **2018**, 013 (2018) [arXiv:1905.09651 [hep-lat]]. *7 citations.*

[15] M. Padmanath, C. B. Lang, L. Leskovec and S. Prelovsek,
EPJ Web Conf. **175**, 05004 (2018) [arXiv:1711.06334 [hep-lat]].

[16] M. Padmanath, C. B. Lang and S. Prelovsek, PoS LATTICE **2015**, 092 (2016) [arXiv:1510.09150 [hep-lat]].

[17] M. Padmanath and N. Mathur, CHARM 2015 proceedings, arXiv:1508.07168 [hep-lat]. *15 citations.*

[18] M. Padmanath, R. G. Edwards, N. Mathur and M. J. Peardon,
PoS LATTICE **2014**, 084 (2015) [arXiv:1410.8791 [hep-lat]]. *9 citations.*

[19] M. Padmanath, R. G. Edwards, N. Mathur and M. Peardon, arXiv:1311.4806 [hep-lat]. *35 citations.*
M. Peardon presented the talk on my behalf and I prepared the proceedings.
I was hospitalized due to renal calculi during the workshop.

[20] M. Padmanath, R. G. Edwards, N. Mathur and M. Peardon,
PoS LATTICE **2013**, 247 (2014) [arXiv:1311.4354 [hep-lat]]. *7 citations.*

Conference proceedings (others)

[21] S. Collins, D. Mohler, M. Padmanath, S. Piemonte, S. Prelovsek and S. Weishaeupl, arXiv:1812.06908 [hep-lat].

[22] L. Leskovec, C. B. Lang, M. Padmanath and S. Prelovsek,
Few Body Syst. **59**, no. 5, 95 (2018) [arXiv:1806.02363 [hep-lat]].

[23] G. Bali, S. Collins, D. Mohler, M. Padmanath, S. Piemonte, S. Prelovsek and S. Weishäupl,
EPJ Web Conf. **175**, 05020 (2018) [arXiv:1806.02651 [hep-lat]].

[24] P. Junnarkar, M. Padmanath and N. Mathur,
EPJ Web Conf. **175**, 05014 (2018) [arXiv:1712.08400 [hep-lat]]. *10 citations.*

[25] S. Mondal, M. Padmanath and N. Mathur,
EPJ Web Conf. **175**, 05021 (2018) [arXiv:1712.08446 [hep-lat]]. *3 citations.*

[26] S. Prelovsek, G. Bali, S. Collins, D. Mohler, M. Padmanath, S. Piemonte and S. Weishäupl,
EPJ Web Conf. **175**, 14006 (2018) [arXiv:1710.06237 [hep-lat]].

[27] N. Mathur, M. Padmanath and R. Lewis,
PoS LATTICE **2016**, 100 (2016) [arXiv:1611.04085 [hep-lat]]. *8 citations.*

[28] S. Basak *et al.* [ILGTI Collaboration],
PoS LATTICE **2014**, 083 (2015) [arXiv:1412.7248 [hep-lat]]. *5 citations.*

[29] S. Basak, S. Datta, A. T. Lytle, M. Padmanath, P. Majumdar and N. Mathur,
PoS LATTICE **2013**, 243 (2014) [arXiv:1312.3050 [hep-lat]]. *18 citations.*

[30] S. Basak, S. Datta, M. Padmanath, P. Majumdar and N. Mathur,
PoS LATTICE **2012**, 141 (2012) [arXiv:1211.6277 [hep-lat]]. *33 citations.*