*Dr. Anil Khachi*
*Assistant Professor*
*Department of Physics*
*St. Bede's College, Shimla*

**Dr. Anil Khachi**
**Assistant Professor**
**Email:** anilkhachi1990@gmail.com
**Mobile No:** +91 7018816976

**EDUCATIONAL QUALIFICATIONS**: M.Sc, PhD

| Sr. No. | Degree | Subject | College/University | Year of Passing |
|---|---|---|---|---|
| 1 | B.Sc. | Physics | Centre of Excellence, Government Post Graduate College, Sanjauli, Shimla | 2011 |
| 2 | M.Sc. | Physics | Himachal Pradesh University | 2013 |
| 4 | Ph.D. | Physics | Central University of Himachal Pradesh | 2023 |
| 6 | Specialization | Theoretical & Computational Nuclear Physics | | |

**TOTAL TEACHING EXPERIENCE:** 3 Years

**RESEARCH EXPERIENCE:** Numerical Simulations of Nuclear Reaction Scattering Cross-sections Using Phase Function Method

*Dr. Anil Khachi*
*Assistant Professor*
*Department of Physics*
*St. Bede's College, Shimla*

**SUBJECTS TAUGHT:** Nuclear & Particle Physics, Computational Physics, Electricity & Magnetism Elements of Modern Physics, Quantum Mechanics, Solid state Physics, Waves & Optics

## ACHIEVEMENTS

### ❖ PUBLICATIONS

i. **Anil Khachi**, Lalit Kumar, M.R. Ganesh Kumar, and O. S. K. S. Sastri. "*Deuteron Structure and Form Factors: Using Inverse Potentials for S-waves*". Phys. Rev. C (2023) .

**DOI:** https://doi.org/10.1103/PhysRevC.107.064002

ii. O. S. K. S. Sastri, **Anil Khachi**, and Lalit Kumar. "*An Innovative Approach to Construct Inverse Potentials Using Variational Monte-Carlo and Phase Function Method: Application to np and pp Scattering*". Braz. J. Phys. **52**, (2022): 58.

**DOI:** https://doi.org/10.1007/s13538-022-01063-1

iii. **Anil Khachi**, Lalit Kumar, Ayushi Awasthi and O. S. K. S. Sastri. "*Inverse Potentials for all l-channels of Neutron-Proton ScatteringR using eference Potential Approach*". Physica Scripta (IOP) (Accepted-2023).

**DOI:** https://doi.org/10.1088/1402-4896/ace99e

iv. **Anil Khachi**, Lalit Kumar and O. S. K. S. Sastri. "*Alpha–Alpha Scattering Potentials for* Various *l-Channels Using Phase Function Method*". Phys. Atom. Nuclei **85**, (2022): 382–391.

**DOI:** https://doi.org/10.1134/S106377882204007X

**v.** Shikha Awasthi, **Anil Khachi**, Lalit Kumar and O. S. K. S. Sastri. "*Numerical Simulation Study of Neutron-Proton Scattering using Phase Function Method*". (AAPT) Am. J. Phys. (Accepted-2023)

vi. **Anil Khachi**, Lalit Kumar and O. S. K. S. Sastri. " $^{3}He - \alpha$ *Elastic Scattering Phase Shifts in Various Channels Using Phase Function Method With Morse Potential*". **J. Nucl. Phy. Mat. Sci. Rad. A.** 9, (2022): 161-167.

**DOI:** https://doi.org/10.15415/jnp.2022.92024

vii. Shikha Awasthi, **Anil Khachi**, and O. S. K. S. Sastri. "*Low Energy S-Wave Proton-Deuteron Scattering Phase-Shifts Using Morse Potential*". J. Nucl. Phy. Mat. Sci. Rad. A. 9, (2022): 223-228.

**DOI**: https://doi.org/10.15415/jnp.2022.92033

viii. Lalit Kumar, **Anil Khachi**, and O. S. K. S. Sastri. "*Phase Shift Analysis for Neutron-Alpha Elastic Scattering Using Phase Function Method With Local Gaussian Potential*". J. Nucl. Phy. Mat. Sci. Rad. A. 9, (2022): 215-221.

**DOI:** https://doi.org/10.15415/jnp.2022.92032

ix. **Anil Khachi**, Lalit Kumar, and O. S. K. S. Sastri. "*Phase Shift Analysis for Alpha-Alpha Elastic Scattering using Phase Function Method for Gaussian Local Potential*". J. Nucl. Phy. Mat. Sci. Rad. A. 9, (2021): 1-5.

**DOI:** https://doi.org/10.15415/jnp.2021.91001

x. **Anil Khachi**, Lalit Kumar, and O. S. K. S. Sastri. "*Neutron-Proton Scattering Phase Shifts in S-Channel Using Phase Function Method for Various Two Term Potentials*". J. Nucl. Phy. Mat. Sci. Rad. A. 9, (2021): 87-93.

**DOI:** https://doi.org/10.15415/jnp.2021.91015

xi. O.S.K.S. Sastri, Swapna Gora, Ayushi Awasthi, and **Anil Khachi**. "*Reviewing relative longevity of beta-stable odd-n nuclei in actinides: Using alpha preformation probabilities from cluster formation model*". Journal of Research: THE BEDE ATHENAEUM **12**, (2021): 1-7.

xii. Shikha Awasthi, **Anil Khachi**, Lalit Kumar, and O. S. K. S. Sastri. "*Triton Scattering Phase-Shifts for S-Wave Using Morse Potential*". J. Nucl. Phy. Mat. Sci. Rad. A. **9**, (2021): 81-85.

**DOI:** https://doi.org/10.15415/jnp.2021.91014

**xiii.** Lalit Kumar, Swapna Gora, Vikram Rana, **Anil Khachi**, and O. S. K. S. Sastri. "*Recalculated Viola-Seaborg Coefficients for Partial Alpha Half-Lives Based on AME2016*". J. Nucl. Phy. Mat. Sci. Rad. A. **9**, (2021): 37-42.

**DOI:** https://doi.org/10.15415/jnp.2021.91007

**xiv.** O. S. K. S. Sastri, Aditi Sharma, Shikha Awasthi, **Anil Khachi**, and Lalit Kumar. "*Simulation of vibrational spectrum of diatomic molecules using Morse potential by matrix methods in gnumeric worksheet.*" Phys. Educ. **36**, (2019): 1-14.

http://www.physedu.in/pub/2020/PE20-09-673

**xv.** Lalit Kumar, Shikha Awasthi, **Anil Khachi**, O.S.K.S Sastri. "*Phase Shift Analysis of Light Nucleon-Nucleus Elastic Scattering using Reference Potential Approach*". ArXiv preprint arXiv:2209.00951 [nucl-th].

**DOI:** arXiv:2209.00951

**xvi.** **Anil Khachi**, Lalit Kumar, O.S.K.S. Sastri. "*Neutron-Proton Interaction Modeled using Morse Function: Constructing Inverse Potentials Using Variational Monte-Carlo and Phase Function Method*".

**arXiv preprint**: arXiv:2104.14788 [nucl-th]. ArXiv:2104.14788

- **Paper Publications and Presented in Conferences**

i. "*Phase Shift Analysis for alpha-alpha Elastic Scattering Using PFM for Gaussian Local Potential*". Online International Conference on Theoretical Aspects of Nuclear Physics 15 - 20 February, 2021 Organised by Department of Physics and Astronomical Sciences(DPAS) Central University of Himachal Pradesh(CUHP) (**Oral presentation**).

ii. "*$^{3}$He- Elastic Scattering Phase Shifts in Various Channels Using Phase Function Method with Morse Potential*". Online International Conference on Recent Trends in Nuclear Physics 16 - 18 February, 2022 Organised by Department of Physics and Astronomical Sciences(DPAS) Central University of Himachal Pradesh(CUHP) (**Oral presentation**).

iii. Shikha Awasthi, Ankush Chauhan, **Anil Khachi**, & O. S. K. S Sastri. "*Neutron-Deuteron S-wave scattering phase shifts using Morse and Manning-Rosen potentials: A comparative analysis*". National conference on emerging trends in physics (NCETP 2021). Organised by Department of Physics Tezpur universty Assam.

iv. **Anil Khachi**, Lalit Kumar, Ayushi Awasthi, & O. S. K. S Sastri. "*P & D inverse Potentials for Neutron-Proton Scattering*". In Proceedings of the DAE-BRNS symposium on nuclear physics, Accepted vol. 66 (2022), In press.

v. Lalit Kumar, **Anil Khachi**, Aman Sharma, & O. S. K. S Sastri. "*Phase Shift Analysis of α – $^{12}$C Elastic Scattering Using Phase Function*

*Method*". In Proceedings of the DAE-BRNS symposium on nuclear physics, Accepted vol. 66 (2022).

vi. Lalit Kumar, **Anil Khachi**, Arushi Sharma, & O. S. K. S Sastri. "*P & D inverse Potentials for Proton-Proton Scattering*". In Proceedings of the DAE-BRNS symposium on nuclear physics. Accepted vol. 66 (2022).

vii. Shikha Awasthi, Amit Kumar, **Anil Khachi** & O. S. K. S. Sastri. "*Cross Section for 3H(α, γ) 7 Li Astrophysical Reaction using Scattering Phase Shifts*". DAE-BRNS High Energy Physics (HEP) Symposium. Accepted (2022).

**Thesis Poster Presented:**

Thesis Poster Presented in **66 th DAE SYMPOSIUM ON NUCLEAR PHYSICS (Cotton University Assam December 2023)** Presented Thesis Entitled " *Numerical Simulations of Nuclear Reaction Scattering Cross-sections Using Phase Function Method*"