

## Sabyasachi Sarkar

HOD & Assistant Professor (Physics)

Department of Applied Sciences and Humanities, DIATM

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**Language Spoken:** Fluent in English, Bengali and Hindi. French is moderate.

### Education:

Degree	Specialization	Name of the School / College & Board / University	Year of Passing
Secondary Education	Science, Arts and Civics.	Asansol Ramakrishna Mission High School, Asansol.	1996
Higher Secondary	Physics Chemistry, Mathematics and Biology.	Ramakrishna Mission Vidyamandir (Belur Math), Belur.	1998
B.Sc. (Hons.)in Physics	Physics as major subject (Honors) with Chemistry and Mathematics.	TDB College, Raniganj. BU	2001
Master Degree in Physics (with Nuclear & Particle Physics specialization)	Master degree in Physics with special paper Nuclear and Particle Physics. <b>Project:</b> <i>To study the Compton scattering in gamma ray spectra using NaI scintillators.</i>	Burdwan University.	2003
Joined in COMPASS Collaboration, CERN, Geneva/Calcutta-COMPASS Group:	Involved in data analysis with Open Charm Leptoproduction at COMPASS collaboration, CERN. Also took part in the analysis to find the performance of Sandwich Veto Detector and detector installation.	CERN (Conseil Européen pour la Recherche Nucléaire), Geneva, Switzerland.	2005
PhD	<b>Thesis title:</b> Study of the longitudinal spin asymmetry of open charm Leptoproduction with compass detector at CERN.	Burdwan University.	Submitted

<b>Research carrier:</b>	<p>The author was involved in Data Analysis of Open-Charm Leptoproduction in <b>COMPASS Collaboration, CERN, Geneva, Switzerland</b>. He is in active collaboration with COMPASS and participates in data taking and analysis of the experiment every year in a regular basis.</p> <p>Another major involvement was in the analysis and installation of Sandwich Veto Detector (<b>author of Sandwich Veto part of the TWiki of COMPASS Experiment and the installation results were discussed in Technical board.. vide COMPASS technical board presentation</b>).</p> <p>Presently involved in COMPASS Phase II experiment and took part in DVCS run last year.</p>
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### 3. Teaching Experience

Sl. No.	Institution / Industry Name	Position / Title	From	To
1	DIATM, Department of AS & HU	Assistant Professor & HOD	September 2008.	HOD from 2015 Dec. to till date

### List of Publications

#### International

1. *Double Spin Asymmetry in Exclusive  $\rho^0$  Muoproduction at COMPASS.* S. Sarkar *et.al.* **European Physics Journal C** **52**, 255–265 (2007).
2. *The Polarised Valence Quark Distribution from Semi-Inclusive DIS.* S. Sarkar *et.al.* **Physics Letters B** **660** (2008) 458–465.
3. *Collins and Sivers Asymmetries for Pions and Kaons in Muon–Deuteron DIS.* S. Sarkar *et.al.* **Physics Letters B** **673** (2009) 127–135.
4. *Gluon Polarisation in the Nucleon and Longitudinal Double Spin Asymmetries from Open Charm Muoproduction.* S. Sarkar *et.al.* **Physics Letters B** **676** (2009) 31–38.
5. *Flavour Separation of Helicity Distributions from Deep Inelastic Muon-Deuteron Scattering.* S. Sarkar *et.al.* **Physics Letters B** **680** (2009) 217–224.
6. *Measurement of the Longitudinal Spin Transfer to  $\Lambda$  and  $\Lambda$ -bar Hyperons in Polarized Muon DIS.* S. Sarkar *et.al.* **European Physics Journal C** **64** (2009) 171–179.
7. *Observation of a  $J^{PC} = 1^{\pm}$  Exotic Resonance in Diffractive Dissociation of 190 GeV/c  $\pi^-$  into  $\pi^- \pi^- \pi^+$ .* S. Sarkar *et.al.* **Physical Review Letters** **104** (2010) 241803.
8. *The Spin-Dependent Structure Function of the Proton  $g_1^p$  and a Test of the Bjorken Sum Rule.* S. Sarkar *et.al.* **Physics Letters B** **690** (2010) 466–472.
9. *Measurement of the Collins and Sivers asymmetries on transversely polarised protons.* S. Sarkar *et.al.* **Physics Letters B** **692** (2010) 240–246.
10. *Azimuthal asymmetries of charged hadrons produced by high energy muons off longitudinally polarized deuterons.* S. Sarkar *et.al.* **European Physics Journal C** **70** (2010) 39–49.
11. *Quark Helicity Distributions from Longitudinal Spin Asymmetries in Muon-Proton and Muon-Deuteron Scattering.* S. Sarkar *et.al.* **Physics Letters B** **693** (2010) 227–235.
12. *First Measurement of Chiral Dynamics in  $\pi^- \gamma \rightarrow \pi^- \pi^- \pi^+$ .* S. Sarkar *et.al.* **Physical Review Letters** **108** (2012) 192001.
13. *Transverse spin effects in hadron-pair production from semi-inclusive deep inelastic scattering.* S. Sarkar *et.al.* **Physics Letters B** **713** (2012) 10.
14. *Exclusive  $\rho^0$  muoproduction on transversely polarised protons and deuterons.* S. Sarkar *et.al.* **Nuclear Physics B** **865** (2012) 1–20.
15.  *$D^*$  and  $D$  Meson Production in Muon-Nucleon Interactions at 160 GeV/c.* S. Sarkar *et. al.* **European Physics Journal C** **72** (2012) 2253.
16. *Leading and Next-to-Leading Order Gluon Polarisation in the Nucleon and Longitudinal Double Spin Asymmetries from Open Charm Muoproduction.* S. Sarkar *et.al.* **Physical Review D** **87**, 052018 (2013).
17. *Study of  $\Sigma(1385)$  and  $\Xi(1321)$  hyperon and antihyperon production in deep inelastic scattering.* S. Sarkar *et. al.* **European Physics Journal C** **73** (2013) 2581.
18. *Hadron transverse momentum distributions in muon deep inelastic scattering at 160 GeV/c.* S. Sarkar *et. al.* **European Physics Journal C** **73** (2013) 2531.
19. *Transverse target spin asymmetries in exclusive  $\rho^0$  muoproduction.* S. Sarkar *et.al.* **Physics Letters B** **731** (2014) 19.
20. *Measurement of azimuthal hadron asymmetries in semi-inclusive deep inelastic scattering off unpolarised nucleons.* S. Sarkar *et. al.* **Nuclear Physics B** **886** (2014) 1046–1077.
21. *A high statistics measurement of transverse spin effects in dihadron production from muon-proton semi-inclusive deep-inelastic scattering.* S. Sarkar *et.al.* **Physics Letters B** **736** (2014) 124.
22. *Measurement of radiative widths of  $a_2(1320)$  and  $\pi_2(1670)$ .* S. Sarkar *et. al.* **European Physics Journal A** **50** (2014) 79.
23. *Spin alignment and violation of the OZI rule in exclusive  $\omega$  and  $\phi$  production in  $pp$  collisions.* S. Sarkar *et. al.* **Nuclear Physics B** **886** (2014) 1078.
24. *Measurement of the charged-pion polarisability.* S. Sarkar *et.al.* **Physical Review Letters** **114** (2015) 062002.

25. Search for exclusive photoproduction of  $Z_c^\pm$  (3900) at COMPASS. S. Sarkar et.al. **Physics Letters B742 (2015) 330.**
26. Odd and Even Partial Waves of  $\eta\pi^-$  and  $\eta'\pi^-$  in  $\pi^- \rightarrow \eta^{(\prime)}\pi^- p$  at 191 GeV/c. S. Sarkar et.al. **Physics Letters B740 (2015) 303.**
27. Collins and Sivers asymmetries in muonproduction of pions and kaons off transversely polarised proton. S. Sarkar et.al. **Physics Letters B744 (2015) 250.**
28. The COMPASS setup for physics with hadron beams. S. Sarkar et.al. **Nuclear Instruments and Methods in Physics Research A779(2015)69–115.**
29. Observation of a new narrow axial-vector meson  $a_1(1420)$ . S. Sarkar et.al. **Physical Review Letters 115 (2015) 082001.**
30. The spin structure function  $g_1^p$  of the proton and a test of the Bjorken sum rule. S. Sarkar et. al. **Physics Letters B753 (2016) 18.**
31. Interplay among transversity induced asymmetries in hadron leptoproduction. S. Sarkar et. al. **Physics Letters B753 (2016) 406.**
32. Resonance Production and  $\pi\pi$  S-wave in  $\pi^- + p \rightarrow \pi^- \pi^- \pi^+ + p_{recoil}$  at 190 GeV/c. S. Sarkar et. al. **Sub. Physical Review D.**
33. Longitudinal double spin asymmetries in single hadron quasi-real photoproduction at high  $p_T$ . S. Sarkar et. al. **Physics Letters B753 (2016) 573.**
34. Leading-order determination of the gluon polarisation from semi-inclusive deep inelastic scattering data S. Sarkar et. al **European Physics Journal C77 (2017) 209.**
35. Multiplicities of charged pions and unidentified charged hadrons from deep-inelastic scattering of muons off an isoscalar target. S. Sarkar et. al. **Sub. Physics Letters B 764 (2017) 001.**
36. Exclusive  $\omega$  meson muoproduction on transversely polarised protons S. Sarkar et. al. **Nuclear Physics B 915 (2017) 454.**
37. Multiplicities of charged kaons from deep-inelastic muon scattering off an isoscalar target. S. Sarkar et. al. **Physics Letters B767 (2017) 133.**
38. Sivers asymmetry extracted in SIDIS at the hard scale of the Drell-Yan process at COMPASS. S. Sarkar et. al. **Physics Letters B770 (2017) 138.**
39. Final COMPASS results on the deuteron spin-dependent structure function  $g_1^d$  and the Bjorken sum rule. S. Sarkar et. al. **Physics Letters B769 (2017) 034.**
40. First measurement of the Sivers asymmetry for gluons from SIDIS data. S. Sarkar et. al. **Physics Letters B772 (2017) 854.**
41. First measurement of transverse-spin-dependent azimuthal asymmetries in the Drell-Yan process. S. Sarkar et. al. **Physical Review Letters 119 (2017) 112002.**
42. New analysis of  $\eta\pi$  tensor resonances measured at the COMPASS experiment. S. Sarkar et. al. **Physics Letters B 779 (2018) 464.**
43. Transverse-momentum-dependent multiplicities of charged hadrons in muon-deuteron deep inelastic scattering. S. Sarkar et. al. **Physical Review D 97, 032006 (2018).**
44. Longitudinal double-spin asymmetry  $A_1^p$  and spin dependent structure function  $g_1^p$  of the proton at small values of  $x$  and  $Q^2$ . S. Sarkar et. al. **Physics Letters B 781 (2018) 464.**

#### National Publications:

1. The COMPASS Polarised Target: S. Sarkar. 17<sup>th</sup> **DAE-BRNS High Energy Physics Symposium, IIT Kharagpur, 11-15 December, 2006.**
2. Open charm Production at COMPASS Experiment: S. Sarkar. **Homi Bhabha Centenary DAE-BRNS High Energy Physics Symposium, Varanasi, Dec 2008.**
3. Sandwich Veto Detector for COMPASS Experiment: S.Sarkar. **National Seminar on Nuclear Instrumentation (NSNI 2010), BARC, Bombay, Feb. 24-26, 2010.**
4. Development and Signal analysis of Sandwich Veto Detector at COMPASS: S. Sarkar and S.S Dasgupta. **DAE-BRNS High Energy Physics Symposium, 13-18 Dec, (2010), Jaipur, India.**
5. In Search of Missing Spin: The COMPASS Experiment at CERN, **All India Seminar, IEL, Durgapur, March 14-15, 2015, p 15-17.**

#### Symposium/Conference/Workshop attended:

- 1) **SPIN-PRAHA 2005**, COMPASS week, International Workshop on Symmetries and Spin, **Prague, Czech Republic**, August 1-5, 2005.
- 2) 17<sup>th</sup> **DAE-BRNS High Energy Physics Symposium, IIT Kharagpur, 11-15 December, 2006.**

- 3) **International School of Physics “Enrico Fermi”**, “Strangeness and Spin in fundamental physics”, **Varena, Italy**. 19-29 June 2007.
- 4) **VI<sup>th</sup> SERC School in Experimental High Energy Physics**, **Jammu University, Jammu**, February 5-24, 2007.
- 5) **First Results from Sandwich Veto Test** : S. Sarkar. **COMPASS Technical Board, CERN**, 4th July, 2007.
- 6) **Homi Bhabha Centenary DAE-BRNS High Energy Physics Symposium, Varanasi**, Dec 2008.
- 7) **National Symposium on Defence Science Education & Research**, CMERI, Durgapur, Dec 19-20, 2009.
- 8) **National Seminar on Nuclear Instrumentation (NSNI 2010)**, **BARC, Bombay**, Feb. 24-26, 2010.
- 9) **DAE-BRNS High Energy Physics Symposium, 13-18 Dec, (2010), Jaipur, India**.
- 10) **All India Seminar, IEL, Durgapur**, 14-15 March, 2015, Durgapur.

**Symposium/Conference/Workshop Organised:**

- 1) **National Seminar, RTASH (Recent Trends in Applied Sciences and Humanities) at DIATM, Durgapur for last Five years** (e.g. 2013, 2014, 2016, 2017 & 2018).
- 2) **Educational tour of 1st yr students at Meghnad Saha Planetarium, Burdwan on 11 November 2016**
- 3) **Industry visit at Mejia Thermal Power Station with students on March 2017.**
- 4) **Seminar on Swami Vivekananda by Swami Jyanibaranandaji of Asansol RKM Ashrama on December 2017.**
- 5) **All India Students Seminar on Innovative Technical Education on 20-21 April. 2018.**

**Achievements**

- 1) **Selected as Institute of Physics Member (MInstP), London on October 2013.**
- 2) **Best Teacher Award, DIATM 2017.**
- 3) **Mentor for two NPTEL Soft Skill courses.**