

DECLARATION

I, **Arun Sharma**, the author of this thesis, declare that the entire work entitled “**Study of Asymmetric and Neutron-Rich Heavy-Ion Collisions Using Isospin-Dependent Quantum Molecular Dynamics Model**” reported in this thesis has been carried out by me under the joint-supervision of my **Research Guides, Prof. Arun Bharti, Department of Physics & Electronics, University of Jammu, Jammu and Prof. Rajeev K. Puri, Department of Physics, Panjab University, Chandigarh.** No part of this work has been submitted in part or full for a degree in any other university.

Dated:

(Arun Sharma)

**POST-GRADUATE DEPARTMENT OF PHYSICS & ELECTRONICS,
UNIVERSITY OF JAMMU, JAMMU TAWI-180006**

CERTIFICATE

It is hereby certified that **Mr. Arun Sharma**, has completed his research work entitled “**Study of Asymmetric and Neutron-Rich Heavy-Ion Collisions Using Isospin-Dependent Quantum Molecular Dynamics Model**” for the degree of **Doctor of Philosophy in Physics** under our joint-supervision and guidance. It is further certified that:

1. The thesis embodies the work of **Mr. Arun Sharma** and is worthy of consideration for the award of Ph.D. degree.
2. The candidate has worked under us for the period required under statutes.
3. The candidate has put in required attendance in Post-Graduate Department of Physics & Electronics, University of Jammu, Jammu during that period.
4. The candidate has fulfilled the statutory conditions as laid down in **Section 18** of statutes governing degree of Doctor of Philosophy issued vide notification no. 4 dated 04.03.2013.

Prof. Vivek K. Gupta
(Head of Department)

Prof. Arun Bharti
(Supervisor)

Prof. Rajeev K. Puri
(Joint - Supervisor)