Dear prospective scientist(s)

Subject: Request for help in conducting experiments to confirm the generalized form of Newton's third law of motion, I freely **Falling and Rebounding** bodies as

$$\text{Reaction } (F_{BA}) = - \text{ Action } (F_{AB})[K_{shape} \times K_{composition} \times K_{target} \times K_{other}]$$

K_i's takes into account the effects of shape, composition, nature of target, and other factors in account.

1.0 Introduction

I am an independent researcher based in Shimla, India in the past, about 45 years I have published papers on the Generalization of Newton's Third Law of Motion.

Now I am retired and have no facilities to conduct experiments to quantitatively confirm the inadequacy of Newton's third law in falling and rebounding bodies.

Kindly help or collaborate to confirm the generalized form of Newton's Third Law. These experiments have been recommended by reputed scientists and editors, and have an impact on fundamental science.

2.0 Theme

Newton's original law

$$\text{Reaction} = -\text{Action} \quad (1)$$

It is unstudied in the case of freely falling and rebounding bodies of mass and composition but of different shapes (*spherical, hemispherical, triangular, hexagonal, polygonal, conical, cylindrical, flat, irregular, needle-like, asymmetrical, or sheet-like (e.g., cardboard).*

2.1 Qualitative observations:

The falling bodies of the same mass and composition have

$$\text{action} = \text{force} = \text{weight} = mg \ (9.8 \text{ newtons}) \quad (2)$$

When they strike the surface, they have the same reaction but in the opposite direction

$$\text{Reaction} = - \text{ Action} = 9.8 \text{ newtons (opposite in direction).} \quad (3)$$

The spherical body rebounds to its original height under certain conditions, so Newton's law as in Eq.(1) is obeyed.

But bodies of different shapes *(* spherical, hemispherical, triangular, hexagonal, polygonal, conical, cylindrical, flat, irregular, needle-like, asymmetrical, or sheet-like (e.g., cardboard) rebound to different heights and varying angles.

Thus, Eq.(1) is not obeyed.

2.2 Role of shape

As bodies have the same mass and composition, only shape is different. They rebound to different heights due to different shapes, so the EFFECT OF SHAPE must be taken in account in Eq.(1)

3.0 Generalized form of Newton's Third Law

$$\text{Reaction } (F_{BA}) = - \text{ Action } (F_{AB})[K_{shape} \times K_{composition} \times K_{target} \times K_{other}]$$

K_i's takes into account the effects of shape, composition, nature of target, and other factors in account.

3.1 Aim

We aim to calculate the values of K_i's experimentally, hence confirm the generalized form of Newton's third law. It requires simple but sensitive experiments.

4.0 Key References:

Peer-Reviewed Publication

Ajay Sharma's Publications on Modifying Newton's Third Law

Publications in 2024 and 2025

1. **Ajay Sharma "The Genuine Effects of the Shape of the Body in Newton's Third Law of Motion Lead to Its Generalization"**
   Science Talks, Vol. 10, Issue 6, 2024.
   https://www.sciencedirect.com/science/article/pii/S2772569324000422

2. **Ajay Sharma " Shape Dependent Form of Newton's Third Law of Motion"**
   Journal of Physics Education, Vol. 38, 2025.
   Read PDF
   https://physedn.in/jpe/article/view/16/12

3. **Ajay Sharma.** presented and published (abstract) in the proceedings of The 38th Annual Convention of the Indian Association of Physics Teachers (16-18th October 2024).

4. To be presented at the International Conference of Physics Education 2025, organized by IUPAP, title *"Shape-Dependent Deviations from Newton's Third Law: Qualitative Observations and a Generalized Equation."*
   link

5. To be presented at the International Conference of Physics Education 2025, organized by IUPAP, title *"Roles of Shape, Composition, and Target Interactions in Rebounding Bodies, Gun Recoil, and Elastic Collisions: Toward a Generalization of Newton's Third Law"*
   Link

EARLIEST publication
about the generalization of Newton's third law (Reaction = -K Action)

6. **Ajay Sharma "Elastic Collisions in One Dimension at the Macroscopic Level and Newton's Third Law of Motion"**
   Acta Ciencia Indica, Vol. XXV P, No. 3, 1999, pp. 113–116.
   www.Acta.co.in

Some of the other publications
on the theme Reaction = -K Action

7. **Ajay Sharma The Principia's third law of motion: In original and generalized forms.** *Phys. Essays* **29** (1), 23–26 (2016), https://doi.org/10.4006/0836-1398-29.1.23.

8. **Ajay Sharma " The Generalized Form of Principia's Third Law of Motion"**
   Indian Journal of Science & Technology, Vol. 10, Issue 34, 2017.

   10.17485/ijst/2017/v10i34/115866
9. **Ajay Sharma "Third Law of Motion: Revisited and Generalized"**
   International Journal of Engineering Research and Applications, Vol. 7, Issue 11, 2017.

https://www.ijera.com/papers/Vol7_issue11/Part-4/N0711047795.pdf

10. **Ajay Sharma "Generalized Form of Newton's Third Law of Motion and NASA's EmDrive"** *ResearchGate*, 2017.
Read Online

11. **Ajay Sharma "Role of Characteristics of Bodies in Newton's Third Law of Motion"** paper no. **PST2A05** *Program Book of American Association of Physics Teachers SM 18*, Washington, USA, 2018, pp. 150–151.
https://aapt.org/Conferences/sm2018/upload/SM18Program_Final_A.pdf

12. ***Ajay Sharma.*** *Int. Journal of Engineering Research and Application, The third example of Newton's Third Law leads to inconsistent results i.e. mass becomes infinite and imaginary.*
ISSN: 2248-9622, Vol. 8, Issue 1, (Part -IV) January 2018, pp.66-71 www.ijera.com
https://www.ijera.com/papers/Vol8_issue1/Part-4/J0801046671.pdf

13. **Ajay Sharma** *Journal of Engineering Research and Application www.ijera.com ISSN : 2248-9622 Vol. 9,Issue 3 (Series -V) March 2019, pp 71-74*
K0903057174.pdf
https://www.ijera.com/papers/vol9no3/Series-5/K0903057174.pdf

14. **Ajay Sharma Third *Application of Principia's third law of motion and role of shape of bodies*,** Proceedings of 107th Indian Science Congress, Physical Sciences, p 106-107, ISC, Bengaluru (2020)

15. **Ajay Sharma "Three Questions: How and Why Newton's Third Law Must be Extended/Generalized?"**
Acta Scientific Pharmacology, Vol. 2, Issue 11, 2021.
https://actascientific.com/ASPC/pdf/ASPC-02-0150.pdf

16. **Ajay Sharma** Qualitative and Quantitative Observations about Newton's Third Law of Motion
Acta Scientific Pharmacology, Vol 3 Issue 3, 2022

17. **Ajay Sharma, Journal of Nature of Science and Sustainable Technology,** *Impact Of Recent Technological Advancements On Newton's Third Law Of Motion And Its Generalization: Part 1, Review* Vol. 15 No. 2 , p. 63-80 , 2021.

Third plus Aeronautics.pdf

18. **Ajay Sharma, Journal of Nature of Science and Sustainable Technology,** *Impact Of Recent Technological Advancements On Newton's Third Law Of Motion And Its Generalization:* Part II, Questions and Answers. Vol. 15 No. 2 , p. 81-85 , 2021.

19. Ajay Sharma Research Square Preprint 2nd April 2021
Quantitative experiments about falling and rebounding bodies of different shapes in view of Newton's Third Law of Motion. | Research Square
https://doi.org/10.21203/rs.3.rs-348954/v1

20. **Ajay Sharma "Qualitative and Quantitative Observations about Newton's Third Law of Motion"**
    Acta Scientific Pharmacology, Vol. 3, Issue 2, 2022.
    https://actascientific.com/ASPC/pdf/ASPC-03-0173.pdf
21. **Ajay Sharma, Proceedings of conference, Recent Advances in Mathematical Science, Conference held at Himachal Pradesh University, Chapter 18, p.** 129-136, 2023
22. Few more publications on the topic i.e. generalization of Newton's third law as

    Reaction (F_{BA}) = - Action (F_{AB})[K_{shape} x $K_{composition}$ x K_{target} x K_{other}]

5.0 Humble Request

I need your kind help in getting the experiments conducted, in your laboratory to confirm shape-based inadequacy in Newton's third law of motion i.e., Reaction (F_{BA})
= - Action (F_{AB})[K_{shape} x $K_{composition}$ x K_{target} x K_{other}]

Even though I am retired, I am deeply interested in seeing this law **experimentally validated** and contributing to the physics community.

Thank you very much for your consideration. I look forward to the possibility of collaboration.

Sincerely,
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7 October 2025