



# Library Indian Institute of Science Education and Research Mohali



**DSpace@IISERMohali (/jspui/)**

**/ Publications of IISER Mohali (/jspui/handle/123456789/4)**

**/ Research Articles (/jspui/handle/123456789/9)**

Please use this identifier to cite or link to this item: <http://hdl.handle.net/123456789/4581>


Title:	The complex intracluster medium of Abell 1569 and its interaction with central radio galaxies
Authors:	Tiwari, Juhi (/jspui/browse?type=author&value=Tiwari%2C+Juhi) Singh, Kulinder Pal (/jspui/browse?type=author&value=Singh%2C+Kulinder+Pal)
Keywords:	intracluster medium Abell 1569 central radio galaxies
Issue Date:	2022
Publisher:	Oxford Academic
Citation:	Monthly Notices of the Royal Astronomical Society, 509(3), 3321-3338.
Abstract:	We present the first in-depth study of X-ray emission from a nearby ( $z \sim 0.0784$ ) galaxy cluster Abell 1569 using an archival Chandra observation. A1569 consists of two unbound subclusters – a northern subcluster (A1569N) hosting a double-lobed radio galaxy 1233+169 at its centre, and a southern subcluster (A1569S) harbouring a wide-angle-tailed (WAT) radio source 1233+168. X-ray emission from A1569N and A1569S extends to a radius $r \sim 248$ kpc and $r \sim 370$ kpc, respectively, indicating that the two gas clumps are group-scale systems. The two subclusters have low X-ray luminosities ( $\sim 1042\text{--}43$ erg s $^{-1}$ ), average elemental abundances $\sim 1/4$ Z $_{\odot}$ , low average temperatures ( $\sim 2$ keV), and lack large ( $r \gtrsim 40\text{--}50$ kpc) cool cores associated with the intracluster gas. We detect a pair of cavities coincident with the radio lobes of 1233+169 in A1569N. The total mechanical power associated with the cavity pair is an order of magnitude larger than the X-ray radiative loss in the cavity-occupied region, providing corroborating evidence for cavity-induced heating of the intragroup gas in A1569N. A1569S exhibits possible evidence for a small-scale cluster-subcluster merger, as indicated by its high central entropy, and the presence of local gas elongation and a density discontinuity in between the bent radio tails of 1233+168. The discontinuity is indicative of a weak merger shock with Mach Number, $M \sim 1.7$ . The most plausible geometry for the ongoing interaction is a head-on merger occurring between A1569S and a subcluster falling in from the west along the line bisecting the WAT tails.
Description:	Only IISER Mohali authors are available in the record.
URI:	<a href="https://doi.org/10.1093/mnras/stab3188">https://doi.org/10.1093/mnras/stab3188</a> ( <a href="https://doi.org/10.1093/mnras/stab3188">https://doi.org/10.1093/mnras/stab3188</a> ) <a href="http://hdl.handle.net/123456789/4581">http://hdl.handle.net/123456789/4581</a> ( <a href="http://hdl.handle.net/123456789/4581">http://hdl.handle.net/123456789/4581</a> )
Appears in	Research Articles (/jspui/handle/123456789/9)
Collections:	

Files in This Item:

File	Description	Size	Format
Need To Add...Full Text_PDF. (/jspui/bitstream/123456789/4581/1/Need%20To%20Add%e2%80%a6Full%20Text_PDF.)		15.36 kB	Unknown

[View/Open \(/jspui/\)](#)

Show full item record (</jspui/handle/123456789/4581?mode=full>)

 (</jspui/handle/123456789/4581/statistics>)

Items in DSpace are protected by copyright, with all rights reserved, unless otherwise indicated.