

This article was downloaded by:[Bochkarev, N.]
On: 19 December 2007
Access Details: [subscription number 788631019]
Publisher: Taylor & Francis
Informa Ltd Registered in England and Wales Registered Number: 1072954
Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Astronomical & Astrophysical Transactions

The Journal of the Eurasian Astronomical Society

Publication details, including instructions for authors and subscription information:
<http://www.informaworld.com/smpp/title~content=t713453505>

A review of: "Supernova"

K. V. Bychkov

Online Publication Date: 01 January 1993

To cite this Article: Bychkov, K. V. (1993) 'A review of: "Supernova"', *Astronomical & Astrophysical Transactions*, 3:4, 349

To link to this article: DOI: 10.1080/10556799308230574

URL: <http://dx.doi.org/10.1080/10556799308230574>

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.informaworld.com/terms-and-conditions-of-access.pdf>

This article maybe used for research, teaching and private study purposes. Any substantial or systematic reproduction, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

BOOK REVIEW

SUPERNOVA 1987A, by V. S. Imshennik & D. K. Nadezhin

All relevant observational data for SN 1987A have been carefully collected by the authors, such as the identification of the Presupernova, spectral and photometric optical observations, X-ray and gamma radiation including the discovery of ^{56}Co gamma-lines, radio emission and neutrino emission. Modern theoretical understanding is summarized simultaneously.

The Presupernova proved to be a massive ($15\text{--}25 M_{\odot}$) B3 supergiant. The observed light curve can be explained in terms of the gas cooling behind a shock wave propagating through the stellar atmosphere during first 50 days and the envelope heated by radioactive cobalt afterwards.

The optical spectra show many overlapping emission and absorption lines, broadened by the Doppler effect, as well as narrow interstellar absorption features in the wavelength range $1200\text{--}2500 \text{ \AA}$. The shape of the line profiles in the region $\lambda\lambda 3500\text{--}9500 \text{ \AA}$ is typical of a gas expanding with a radial velocity gradient. The optical and near-infrared spectra can be explained by the presence of hydrogen lines as well as those of neutral and singly ionized Na, Mg, Si, Ca, Ti, Cr, Fe and Ni. No evidence has been found for higher than normal relative abundances of these elements. The analysis of the line shapes provides information about the density gradient inside the envelope. Infrared observations revealed CO and SiO emission bands in the $4\text{--}13 \mu\text{m}$ range, and rather highly ionized FeIII, S III, and S IV in $\lambda\lambda 16\text{--}29 \mu\text{m}$.

The X-ray emission was discovered in the photon energy range $20\text{--}300 \text{ keV}$ and at $4\text{--}30 \text{ KeV}$. It can originate from the decay of ^{56}Co and from a young pulsar.

The radio emission from SN 1987A was detected nearly two days after the optical flare at frequencies 0.843 GHz , 1.4 GHz , 2.3 GHz , and 8.4 GHz . The radio pulse has carried away approximately $8 \cdot 10^{38}$ ergs during nearly 5 days. The brightness temperature exceeded 10^7 K , implying a non-thermal origin of the radio emission. Radio flares with such properties have never been observed in other extragalactic supernovae.

The observations of the neutrino pulse are consistent with the model of $2 M_{\odot}$ iron-oxygen stellar core collapsing onto a neutron star.

K. V. BYCHKOV