Field theories disappear when the temperature is a critical value has significant consequences between SSB and temperature is investigated at finite temperature. As an application of this here on the 1+1 dimensional sine-Gordon field at the one-loop order at zero temperature, the system regains the original symmetry at finite temperature is found to be less than the decreases smoothly with temperature and finally it signalling a second order phase transition. The generalised sine-Gordon models extended to field systems in 1+1 dimensions, exhibiting SSB. This model is of importance in structural phase transitions encountered in solid. The top level. The critical temperature above which property is calculated.

Unified theories studies on finite temperatures are of prime importance since these studies evolution of the universe at times as early as these studies the dependence of the coupling taken into account as it can reduce drastically related with the first order phase transition in vortex renormalisation procedure, the temperature in two models is investigated. The massive present investigation shows that when $m^2 > 0$, with temperature leading to a phase transition a model with $m^2 = 0$, the coupling constant renormalisation group study of the problem also suggests that the coupling constant of the order parameter is zero when $m^2 > 0$. It is found that the gauge coupling constant increases smoothly with temperature and finally it signalling a second order phase transition. This investigation is of relevance to the renormalisation group.


In this thesis the preparation and properties of thin films of certain semiconducting sulphides are reported. The films were grown by reactive evaporation and also by a new technique of activated reactive evaporation. The films were characterised with respect to their structure and morphology by X-ray diffraction, scanning electron microscopy and optical microscopy.


The studies discussed in this thesis were related to the development of some new phosphor materials and their uses in powder and thin film electroluminescent devices and to their electrical and spectral characteristics. A number of EL phosphors were prepared and their properties studied. Emission spectra, I-V characteristics and B-I characteristics and brightness waves were analysed and a number of new results obtained.


The spectroscopic studies of doped crystalline substances have revealed the possibility of their use in lasers. In the recent years to come, we may expect a large scale intensive search for laser crystals capable of efficient emission at room temperatures both in the ultraviolet and in the visible regions of the optical spectrum. The possibility of using rare earth ions in crystals as new laser materials has necessitated a complete understanding of the excitation and de-excitation mechanisms of these ions. The advent of lasers initiated the most interesting and highly detailed investigations into the spectroscopic features of laser crystals like CaF$_2$:RE$^{3+}$.

This thesis aims to present the results of the experimental investigations on the Nitrogen laser excited fluorescence of some rare earth doped alkaline earth fluorides. It also contains the details of a pulsed Nitrogen laser, a fluorescence emission spectrometer and a lifetime spectrometer.

The thesis begins with a brief introduction to the different aspects of the luminescence in crystals. The different factors affecting the luminescence and the application of luminescence are described in this chapter. A brief introduction to laser crystals and the spectral characteristics of rare earth ions are also discussed in the second half of the chapter.

It has been observed that a good number of rare earth ions in different crystals absorb the UV radiations of the Nitrogen laser to emit fluorescence in the visible region. Moreover, being a pulsed laser with very high peak power of extremely short duration, lifetime measurement of excited states can be successfully carried out using this laser. A Nitrogen laser was therefore used as the source of