

**SYNTHESIS AND CHARACTERIZATION OF  
CARBON-QUANTUM DOT METHYLENE BLUE  
COMPOSITE FOR ANTIMICROBIAL  
PHOTODYNAMIC THERAPY**

*Project submitted to the University of Kerala in partial fulfilment of the  
requirements for the award of the Degree of Master of Science in Physics*

**ANAKHALEKSHMI V S**

Candidate code: 63021118003

Exam code: 63020401

Subject code: PH 201

**POST GRADUATE AND RESEARCH DEPARTMENT OF PHYSICS  
MAHATMA GANDHI COLLEGE  
THIRUVANANTHAPURAM**

**Year 2021- 2023**

**SYNTHESIS AND CHARACTERIZATION OF  
CHITOSAN BASED MUCOADHESIVE FILM  
CONTAINING 5-ALA ORAL PHOTODYNAMIC  
THERAPY**

*Dissertation submitted to the University of Kerala in partial fulfilment of the  
requirements for the award of the degree of Master of Science in Physics*

**ARDRA A.K**

Candidate code: 63021118006

Exam code: 63020401

Subject code: PH 201

**POST GRADUATE AND RESEARCH DEPARTMENT OF PHYSICS  
MAHATMA GANDHI COLLEGE  
THIRUVANANTHAPURAM  
Year 2021- 2023**

**DEVELOPMENT OF CHITOSAN BASED  
TOLUIDINE BLUE O HYDROGEL  
FORMULATION FOR ANTIMICROBIAL  
PHOTODYNAMIC THERAPY**

*Dissertation submitted to the University of Kerala in partial fulfilment of the  
requirements for the award of the Degree of Master of Science in Physics*

**VARSHA R**

Candidate code: 63021118018

Exam code: 63020401

Subject code: PH 201

**POST GRADUATE AND RESEARCH DEPARTMENT OF PHYSICS  
MAHATMA GANDHI COLLEGE  
THIRUVANANTHAPURAM  
Year 2021- 2023**

**SYNTHESIS AND CHARACTERIZATION OF  
CHITOSAN BASED MUCOADHESIVE FILM  
CONTAINING 5-ALA ORAL PHOTODYNAMIC  
THERAPY**

*Dissertation submitted to the University of Kerala in partial fulfilment of the  
requirements for the award of the degree of Master of Science in Physics*

**ARDRA A.K**

**Candidate code: 63021118006**

**Exam code: 63020401**

**Subject code: PH 201**

**POST GRADUATE AND RESEARCH DEPARTMENT OF PHYSICS  
MAHATMA GANDHI COLLEGE  
THIRUVANANTHAPURAM  
Year 2021- 2023**

# A STUDY ON THE VARIATION OF TROPOPAUSE HEIGHT

*Project submitted to the University of Kerala in partial fulfilment of the  
requirements for the award of the Degree of Master of Science in Physics*

RESHMA SANTHOSH J S

Candidate code: 63021118016

Exam code: 63020401

Subject code: PH 201

POST GRADUATE AND RESEARCH DEPARTMENT OF PHYSICS  
MAHATMA GANDHI COLLEGE  
THIRUVANANTHAPURAM  
Year 2021- 2023

**COMBUSTION SYNTHESIS AND  
CHARACTERISATION OF SAMARIUM  
MANGANITE NANOPEROVSKITES**

*Project submitted to the University of Kerala in partial fulfilment of the  
requirements for the award of the Degree of Master of Science in Physics*

**ASWIN RL**

**Candidate code: 63021118007**

**Exam code: 63020401**

**Subject code: PH 201**

**POST GRADUATE AND RESEARCH DEPARTMENT OF PHYSICS**

**MAHATMA GANDHI COLLEGE**

**THIRUVANANTHAPURAM**

**Year 2021- 2023**

# Optimizing Ring Resonator Design for High-Speed Modulation in Communication Systems

*Dissertation submitted to the  
University of Kerala*

*In partial fulfilment of the requirements for the award of the degree of  
Masters of Science in Physics*

By,

ADWAITHA J. II.

Candidate Code: 63021118002

POST GRADUATE & RESEARCH DEPARTMENT OF PHYSICS  
MAHATMA GANDHI COLLEGE  
THIRUVANNATHAPURAM

Under the guidance of  
Dr. SOORAJ R.  
Associate Professor  
Department of Avionics



INDIAN INSTITUTE OF SPACE SCIENCE AND TECHNOLOGY  
VALIAMALA THIRUVANNATHAPURAM  
AUGUST 2023

**A study of exoplanet searching techniques on Kepler K2  
database using Lightcurve python package**

*Project submitted to the University of Kerala in partial fulfillment of the  
requirements for the award of the Degree of Master of Science in Physics*

**ARATHY AJ**

**Candidate code: 63021118005**

**Exam code: 63020-401**

**Subject code: PH 201**

**POST GRADUATE AND RESEARCH DEPARTMENT OF PHYSICS**

**MAHATMA GANDHI COLLEGE**

**THIRUVANANTHAPURAM**

**Year 2021- 2023**



**AVIATION EFFECTS ON OZONE AND ASSESSMENT  
USING AVIATION MODELS**

*A Dissertation Submitted to the University of Kerala in Partial fulfillment for  
the Award of the degree of Master of Science in Physics.*

**APARNA SANKAR R S**

Candidate Code : 63021118004

Exam Code : 63020401

Subject Code : PH 201

**POST GRADUATE AND REASERCH DEPARTMENT OF PHYSICS**

**MAHATMA GANDHI COLLEGE**

**THIRUVANANTHAPURAM**

**2021-2023**

**A Study On The Atmospheric Tides In The  
Mesosphere And Lower Thermosphere Region Over  
Thiruvananthapuram (8.5 N, 76.5 E)**

*Project submitted to the University of Kerala in partial fulfilment of the requirements for  
the award of the degree of Master of Science in Physics*

**HARSHA S**

**Candidate code: 63021118009**

**Exam Code: 63020401**

**Subject Code: PH201**

**POSTGRADUATE AND RESEARCH DEPARTMENT OF PHYSICS  
MAHATMA GANDHI COLLEGE  
THIRUVANANTHAPURAM**

**Year 2021-2023**

**STUDIES ON STRUCTURAL AND OPTICAL  
PROPERTIES OF NiMO<sub>4</sub> NANOPARTICLES  
SYNTHESIZED THROUGH COMBUSTION  
ROUTE**

*Project submitted to the University of Kerala in partial fulfilment of the  
requirements for the award of the Degree of Master of Science in Physics*

**ABHIRAMI A**

Candidate code: 63021112001

Exam code: 63020401

Subject code: PH 201

**POST GRADUATE AND RESEARCH DEPARTMENT OF PHYSICS  
MAHATMA GANDHI COLLEGE  
THIRUVANANTHAPURAM  
Year 2021- 2023**

**A study of exoplanet searching techniques on Kepler K2  
database using Lightkurve python package**

*Project submitted to the University of Kerala in partial fulfilment of the  
requirements for the award of the Degree of Master of Science in Physics*

**ARATHY AJ**

Candidate code: 63021118005

Exam code: 63020401

Subject code: PH 201

**POST GRADUATE AND RESEARCH DEPARTMENT OF PHYSICS**

**MAHATMA GANDHI COLLEGE**

**THIRUVANANTHAPURAM**

**Year 2021-2023**

# Growth And Optical Characterization of Strontium Complex Of 1, 3, 5 – Triazinane – 2, 4, 6 – Trione in Gel

*Dissertation submitted to the*

*University of Kerala*

*In partial fulfilment of the requirements for the award of the degree of*

*Masters of Science In Physics*

*By,*

**DEVIKA J. A.**

**Candidate code: 63021118008**

**Exam Code: 63020401**

**Subject code: PH 201**

**POST GRADUATE AND RESEARCH DEPARTMENT OF PHYSICS**

**MAHATMA GANDHI COLLEGE**

**THIRUVANANTHAPURAM**

**2021 – 2023**

**A STUDY ON THE VARIATION OF TROPICAL  
HEIGHT**

*Project submitted to the University of Kerala in partial fulfillment of the  
requirements for the award of the Degree of Master of Science in Physics*

**RESHIMA SANTHOSH J S**

Candidate code: 63021118016

Exam code: 63020401

Subject code: PH 201

**POST GRADUATE AND RESEARCH DEPARTMENT OF PHYSICS**

**MAHATMA GANDHI COLLEGE**

**THIRUVANANTHAPURAM**

**Year 2021-2023**

**DEVELOPMENT AND CHARACTERIZATION OF  
HYDROGEL CONTAINING CHITOSAN AND  
METHYLENE BLUE FOR ANTIMICROBIAL  
PHOTODYNAMIC THERAPY**

*Dissertation submitted to the University of Kerala in partial fulfilment of the  
requirements for the award of the Degree of Master of Science in Physics*

**NANDITHA M KESH**

Candidate code: 63021118015

Exam code: 63020401

Subject code: PH 201

**POST GRADUATE AND RESEARCH DEPARTMENT OF PHYSICS  
MAHATMA GANDHI COLLEGE  
THIRUVANANTHAPURAM  
Year 2021- 2023**

# Optimizing Ring Resonator Design for High-Speed Modulation in Communication Systems

*Dissertation submitted to the  
University of Kerala  
In partial fulfilment of the requirements for the award of the degree of  
Masters of Science in Physics*

By,  
ADWAITHA J. H.  
Candidate Code: 63021118002

POST GRADUATE & RESEARCH DEPARTMENT OF PHYSICS  
MAHATMA GANDHI COLLEGE  
THIRUVANNATHAPURAM

Under the guidance of  
Dr. SOORAJ R.  
Associate Professor  
Department of Avionics



INDIAN INSTITUTE OF SPACE SCIENCE AND TECHNOLOGY  
VALIAMALA THIRUVANNATHAPURAM  
AUGUST 2023



**Synthesis, Characterisation and  
Photoluminescent Properties of Praseodymium  
doped SrCeO<sub>3</sub> Perovskites**

*Project submitted to the University of Kerala in partial fulfilment of the  
requirements for the award of the Degree of Master of Science in Physics*

**KEERTHANA PS**

**Candidate code: 63021118012**

**Exam code: 63020401**

**Subject code: PH 201**

**POST GRADUATE AND RESEARCH DEPARTMENT OF PHYSICS**

**MAHATMA GANDHI COLLEGE**

**THIRUVANANTHAPURAM**

**Year 2021- 2023**



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## MAHATMA GANDHI COLLEGE

Kesavadasapuram, Pattom P. O.

Thiruvananthapuram 695 004

E-mail: [physics@mgcollegetvm.org](mailto:physics@mgcollegetvm.org)

25-08-2023

### PROJECT COMPLETION CERTIFICATE

This is to certify that Ms. **Devika J A** (Candidate code: 63021118008) has completed a project titled "**Growth and optical characterisation of Strontium cyanurate crystals in gel**" under the supervision of Dr. Bijini B R as partial fulfilling of the requirement for the award of Master of Science degree in Physics from the University of Kerala during 2021-2023.

  
Dr. Padma Kumar H.

(Head of the Department)

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25-08-2023

### PROJECT COMPLETION CERTIFICATE

This is to certify that Mr. **Aswin R.L.** (Candidate code: 63021118007) has completed a project titled "**Combustion synthesis and characterization of samarium manganite nano perovskites**" under the supervision of Dr. Kavita V.T. as partial fulfilling of the requirement for the award of Master of Science degree in Physics from the University of Kerala during 2021-2023.

Dr. Padma Kumar H.

(Head of the Department)

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---

25-08-2023

### PROJECT COMPLETION CERTIFICATE

This is to certify that Ms. **ARDRA A K** (Candidate code: 63021118006) has completed a project titled "*Synthesis and characterization of chitosan based mucoadhesive film containing 5-ALA oral photodynamic therapy*" under the supervision of Dr. Prasanth CS as partial fulfilling of the requirement for the award of Master of Science degree in Physics from the University of Kerala during 2021-2023.

  
Dr. Padma Kumar H.

(Head of the Department)

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25-08-2023

#### PROJECT COMPLETION CERTIFICATE

This is to certify that Ms. **Arathy A J** (Candidate code: 63021118005) has completed a project titled "**A study of exoplanet searching techniques on Kepler, K2 database using lightkurve python package**" under the supervision of Dr Vaisakhan Thampi as partial fulfilling of the requirement for the award of Master of Science degree in Physics from the University of Kerala during 2021-2023.

  
Dr. Padma Kumar H.

(Head of the Department)

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25-08-2023

### PROJECT COMPLETION CERTIFICATE

This is to certify that Ms. **Aparna Sankar R S** (Candidate code: 63021118004) has completed a project titled "**Aviation effects on ozone and assessment using aviation models**" under the supervision of Dr. Sujatha Lakshmi as partial fulfilling of the requirement for the award of Master of Science degree in Physics from the University of Kerala during 2021-2023.

  
Dr. Padma Kumar H.

(Head of the Department)

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---

25-08-2023

### PROJECT COMPLETION CERTIFICATE

This is to certify that Ms. **Anakhalekshmi V. S.** (Candidate code: 63021118003) has completed a project titled "**Synthesis and Characterization of Carbon Quantum Dot Methylene Blue Composite for Antimicrobial Photodynamic Therapy**" under the supervision of Dr. Prasanth C. S. as partial fulfilling of the requirement for the award of Master of Science degree in Physics from the University of Kerala during 2021-2023.

  
Dr. Padma Kumar H.

(Head of the Department)

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25-08-2023

### PROJECT COMPLETION CERTIFICATE

This is to certify that Ms. **ADWAITHA J. H.** (Candidate code: 63021118002) has completed a project titled "*Optimizing Ring Resonator Design for High-Speed Modulation in Communication Systems*" under the supervision of Dr. Vaisakhan Thampi D. S. as partial fulfilling of the requirement for the award of Master of Science degree in Physics from the University of Kerala during 2021-2023.

Dr. Padma Kumar H.

(Head of the Department)

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25-08-2023

### PROJECT COMPLETION CERTIFICATE

This is to certify that Ms. **Abhirami.A** (Candidate code: 63021118001) has completed a project titled "***Studies on Structural and Optical properties of NdMnO<sub>3</sub> Nanoparticles synthesized through Combustion route.***" under the supervision of Dr. Kavitha V.T as partial fulfilling of the requirement for the award of Master of Science degree in Physics from the University of Kerala during 2021-2023.

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MAHATMA GANDHI COLLEGE  
THIRUVANANTHAPURAM

Dr. Padma Kumar H.

(Head of the Department)



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25-08-2023

### PROJECT COMPLETION CERTIFICATE

This is to certify that Ms. **HARSHA S** (Candidate code: 63021118009) has completed a project titled "**A Study on the Atmospheric tides in the Mesosphere and Lower Thermosphere Region over Thiruvananthapuram (8.5°N, 76.5°E)**" under the supervision of Dr. Deepa V as partial fulfilling of the requirement for the award of Master of Science degree in Physics from the University of Kerala during 2021-2023.

Dr. Padma Kumar H.

(Head of the Department)

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---

25-08-2023

### PROJECT COMPLETION CERTIFICATE

This is to certify that Ms. **Keerthana PS** (Candidate code: 63021118012) has completed a project titled "*Synthesis, Characterisation and Photoluminescent Properties of Praseodymium doped SrCeO<sub>3</sub> Perovskites*" under the supervision of Dr Padmakumar H as partial fulfilling of the requirement for the award of Master of Science degree in Physics from the University of Kerala during 2021-2023.

Dr. Padma Kumar H.

(Head of the Department)

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KESAVADASAPURAM,



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---

25-08-2023

### PROJECT COMPLETION CERTIFICATE

This is to certify that Ms. **K A HARITHA** (Candidate code: 63021118010) has completed a project titled "*Total Electron Content Variation During Coronal Mass Ejections*" under the supervision of K G SIMI as partial fulfilling of the requirement for the award of Master of Science degree in Physics from the University of Kerala during 2021-2023.

  
Dr. Padma Kumar H.

(Head of the Department)

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---

25-08-2023

## PROJECT COMPLETION CERTIFICATE

This is to certify that Ms. **Keerthi Vikraman** (Candidate code: 63021118013) has completed a project titled "*The manifestation of fluctuations of IMF components during solar maxima and minima days*" under the supervision of Dr. Sujatha Iekshmi as partial fulfilling of the requirement for the award of Master of Science degree in Physics from the University of Kerala during 2021-2023.

Dr. Padma Kumar H.

(Head of the Department)

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---

25-08-2023

#### PROJECT COMPLETION CERTIFICATE

This is to certify that Ms. **Meenakshi C S** (Candidate code: 63021118014) has completed a project titled "*Total Electron Content Variation During Geomagnetic Storm*" under the supervision of Dr. Simi K G as partial fulfilling of the requirement for the award of Master of Science degree in Physics from the University of Kerala during 2021-2023.

Dr. Padma Kumar H.

(Head of the Department)

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DEPARTMENT OF PHYSICS  
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---

25-08-2023

### PROJECT COMPLETION CERTIFICATE

This is to certify that Ms. **RESHMA SANTHOSH J S** (Candidate code: 63021118016) has completed a project titled "*A Study on the Variation of Tropopause Height*" under the supervision of Dr. DEEPA V as partial fulfilling of the requirement for the award of Master of Science degree in Physics from the University of Kerala during 2021-2023.

Dr. Padma Kumar H.

(Head of the Department)

**HEAD**  
**DEPARTMENT OF PHYSICS**  
**MAHATMA GANDHI COLLEGE**  
**THIRUVANANTHAPURAM**



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E-mail: [physics@mgcollegetvm.org](mailto:physics@mgcollegetvm.org)

25-08-2023

### PROJECT COMPLETION CERTIFICATE

This is to certify that Ms. **VARSHA R** (Candidate code: 63021118018) has completed a project titled "*Development of Chitosan Based Toluidine Blue O Hydrogel Formulation for Antimicrobial Photodynamic Therapy*" under the supervision of Dr. J M Raj as partial fulfilling of the requirement for the award of Master of Science degree in Physics from the University of Kerala during 2021-2023.

Dr. Padma Kumar H.

(Head of the Department)

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---

25-08-2023

### PROJECT COMPLETION CERTIFICATE

This is to certify that Ms. **Nanditha M Kesh** (Candidate code: 63021118015) has completed a project titled "*Development and Characterization of Hydrogel Containing Chitosan and Methylene Blue for Antimicrobial Photodynamic Therapy*" under the supervision of Dr. J M Raj as partial fulfilling of the requirement for the award of Master of Science degree in Physics from the University of Kerala during 2021-2023.

Dr. Padma Kumar H.

(Head of the Department)

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25-08-2023

### PROJECT COMPLETION CERTIFICATE

This is to certify that Ms. **Salma Surumi** (Candidate code: 63021118017) has completed a project titled "**Growth and thermal characterization of strontium complex of 1, 3, 5 - triazinane- 2,4,6- trione in gel**" under the supervision of Dr. Bijini B R as partial fulfilling of the requirement for the award of Master of Science degree in Physics from the University of Kerala during 2021-2023.

Dr. Padma Kumar H.

(Head of the Department)

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