



Republic of the Philippines
CEBU NORMAL UNIVERSITY
Osmeña Blvd. Cebu City, 6000 Philippines

**RESEARCH INSTITUTE
FOR COMPUTATIONAL
MATHEMATICS AND PHYSICS**
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YEAR-END REPORT (C.Y. 2021)

This report is based on the following goals of the Research Institute for Computational Mathematics and Physics:

- Perform research of high quality in the field of computational mathematics and physics
- Develop tools and methodologies based on computational mathematics and physics for the use in teaching and learning as well as in industries.

Below are the highlights of the accomplishments of the research institute for CY 2020:

- **Perform research of high quality in the field of computational mathematics and physics**
 - The institute has conducted/organized the following training-workshop:

Name of Seminars, Trainings, and Conferences	Date and Venue	Involvement	Acquired
RICMP Lecture Series 1 and Research Proposal Workshop	Date: March 12, 2021 Venue(Virtual): Zoom	<i>Organizer</i> <i>Resource Speaker:</i> Dr. Cristina B. Corcino RICMP Researcher <i>Title of the Talk:</i> Logarithmic Generalization of Lambert W Function and Its Applications to Adiabatic Thermostatistics of Three-Parameter Entropy	Tools and methodologies in conducting research on Generalization of Lambert W Function and Its Applications 10 Full-Blown Research Project Proposals

<p>Breakthroughs in Mathematics (A Seminar Conducted by the Department of Mathematics & Computer Science of the University of the Philippines Baguio)</p>	<p>Date: March 19, 2021 Venue(Virtual): Zoom</p>	<p><i>Resource Speaker:</i> Dr. Roberto B. Corcino RICMP Director</p> <p><i>Title of the Talk:</i> Research Trends in Combinatorics</p>	<p>Popularity of CNU and RICMP</p> <p>Possible Research Collaboration with UP Baguio</p>
<p>Lecture Series and Research Training Workshop on Special Topics of Combinatorics and Special Functions</p>	<p>Date: April 12-14, 2021 Venue(Virtual): Zoom</p>	<p><i>Organizer</i></p> <p><i>Resource Speaker:</i> Dr. Istvan Mezo Research Professor, Nanjing University of Information Science and Technology, CHINA</p> <p><i>Title of the Talk:</i> Covering theory, Fundamental Groups, and the Reimann Surface of (r-)Lambert Function</p>	<p>Tools and methodologies in conducting research on Covering theory, Fundamental Groups, and the Reimann Surface of Generalized Lambert Function</p> <p>Two (2) Full-Blown Research Project Proposals</p>
<p>2021 MSP Region VII Research Congress and Convention</p>	<p>Date: December 3 and 10, 2021 Venue(Virtual): Zoom</p>	<p><i>Co-Organizer</i></p> <p><i>Convention Chair:</i> Dr. Roberto B. Corcino RICMP Director</p> <p><i>Members of the Working Committees:</i> Dr. Cristina B. Corcino RICMP Affiliated Researcher</p> <p><i>Members of Technical Team</i> VPREP Staff RICMP Research Assistants</p>	<p>Popularity of CNU and RICMP</p> <p>Possible Research Collaborations with universities in the region</p>

- The researchers of the institute have attended the following seminars, trainings, and conferences:

Name of Seminars, Trainings, and Conferences	Date and Venue	Involvement	Acquired
2021 Mathematical Society of the Philippines (MSP) Annual National Convention	Date: May 15, 22 and 29, 2021 Venue (Virtual): Zoom	<i>Paper Presenter:</i> Dr. Roberto B. Corcino RICMP Director <i>Title of the Talk:</i> Translated Logarithmic Lambert Function and Its Applications in Three-Parameter Entropy	Popularity of CNU and RICMP Dissemination of RICMP Research Outputs
3rd International Conference for the Arts and Sciences (I-CAS) with the theme “New Normal Realities: Role of the Artists and the Scientists”	Date: September 22-23, 2021 Venue (Virtual): Zoom	<i>Paper Presenter:</i> Dr. Roberto B. Corcino RICMP Director <i>Title of the Talk:</i> Higher Order Apostol-Frobenius-Type Poly-Genocchi Polynomials with Parameters	Popularity of CNU and RICMP Dissemination of RICMP Research Outputs (funded by CNU-CRD)
Second series of VISION 2021: Virology Science and Technology Institute of the Philippines Information, Opportunities and Networking Webinar	Date: July 16, 2021 Venue(Virtual): Zoom	<i>Participant</i> Dr. Roberto B. Corcino RICMP Director	Tools and methodologies in conducting research on modelling the spread of infectious disease
43rd Annual Scientific Meeting (ASM) of the National Academy of Science and Technology, Philippines (NAST PHL)	Date: July 13-15, 2021 Venue (Virtual): Zoom	<i>Participant</i> Dr. Roberto B. Corcino RICMP Director	Popularity of CNU and RICMP Recent Research Activities of NAST Members as well as possible participation in NAST projects for

			policy recommendation
16th Annual Meeting and Scientific Convention (AMSC) of the Outstanding Young Scientists, Inc. (OYSI) of National Academy of Science and Technology, Philippines (NAST PHL)	Date: July 12, 2021 Venue (Virtual): Zoom	<i>Participant</i> Dr. Roberto B. Corcino RICMP Director	Popularity of CNU and RICMP Recent Research Activities of OYSI Members as well as possible participation in OYSI projects for policy recommendation
Radio Interview in Pinoy Scientists Program (Radio Agila Station)	Date: July 18, 2021 Venue (Virtual): Zoom	<i>Guest Interviewees:</i> Dr. Roberto B. Corcino RICMP Director Dr. Cristina B. Corcino RICMP Researcher CAS Research Chair <i>Episode Title:</i> Three Filipino Scientists' Tips on Research Productivity	Popularity of CNU and RICMP
42nd NAST Annual Scientific Meeting	Date: July 8-10, 2020 Venue (Virtual): Zoom	<i>Participant: RICMP Director</i>	Updates on new research trends in sciences and technology, particularly, on the solutions to long-standing concerns
Conducting and Writing Literature Review and Systematic Analyses in the New Normal	Date: October 19-23, 2020 Venue (Virtual): Zoom	<i>Participant: RICMP Director and Division Chairs</i>	Updates on the new strategy in writing literature review and systematic analyses

Lecture Series and Training Workshop on Fundamentals of Quantitative Ecology and Epidemiology	Date: November 3-6, 2020 Venue (Virtual): Zoom	Participant: <i>RICMP Director and Division Chairs</i>	Math modelling tools and methodologies in forecasting the structure of the ecosystems and values of epidemiological parameters
Scientific Session and Business Meeting of the NRCP Division of Mathematical Sciences	Date: October 26, 2020 Venue (Virtual): Zoom	Participant: <i>RICMP Director</i>	Updates on the recent development in the Mathematical Science Division of NRCP and role of mathematics in addressing problems of the country during the pandemic
NRCP Regional Basic Research Caravan	Date: September 30, 2020 Venue (Virtual): Zoom	Participant: <i>RICMP Director</i>	Updates on the R&D niches in Central Visayas Region
2nd International Conference on Arts and Sciences (ICAS 2020)	Date: September 29-30, 2020 Venue (Virtual): Zoom	Paper Presenter Title of the Paper: <i>Higher Order Apostol-Type Poly-Genocchi Polynomials with Parameters a, b, c</i> Award Received: Best Paper Presenter	Updates on the recent development of research in arts and sciences Dissemination of research outputs
Forum on Balik Scientist Program Conducted by Department of Science and Technology (DOST)-PCIEERD	Date: November 17, 2020 Venue (Virtual): Zoom	Participant: <i>RICMP Director</i>	Updates on the Balik Scientist Program in the Philippines
Training-Workshop on the Packaging of Collaborative Research Proposal Conducted by the Commission on Higher Education (CHED)	Date: November 19, 2020 Venue (Virtual): Zoom	Participant: <i>RICMP Director</i>	Tips on packaging a project proposal for external funding

through the Philippine-California Advanced Research Institutes (PCARI)			
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- The institute has produced the following completed researches and publications in journals indexed by **Web of Science, Scopus and Asian Citation Index**:

Title	Status	Date of Completion/ Publication
<i>Logarithmic Generalization of the Lambert W Function and Its Applications to Adiabatic Thermostatistics of the Three- Parameter Entropy</i> Cristina B. Corcino and Roberto B. Corcino	Published <i>Advances in Mathematical Physics</i> Volume 2021, Article ID 6695559, 16 pages https://doi.org/10.1155/2021/6695559 Indexed by Web of Science (Clarivate Analytics, Category: SCIE) and SCOPUS	February 2021
<i>Explicit Formulas for the First Form (q,r)-Dowling Numbers and (q,r)-Whitney-Lah Numbers</i> R.B. Corcino, J.M. Ontolan and M.R.T. Lobrigas	Published <i>European Journal of Pure and Applied Mathematics</i> Volume 14(1) (2021), 65-81 Indexed by Web of Science and SCOPUS	January 2021
<i>A q-analogue of generalized translated Whitney numbers: Cigler's approach</i> R.B. Corcino, Jezer C. Fernandez and Mary Ann Ritzell Vega	Published <i>Journal of Mathematics and Computer Science</i> Volume 24 (2022), 82–96 Indexed by Web of Science and SCOPUS	January 2021
<i>A p,q-Analogue of Qi-Type Formula for r-Dowling Numbers</i> Roberto Corcino, Amerah Dibagulun, Mary Ann Ritzell Vega	Published Online <i>Journal of Mathematics and Computer Science</i> , Volume 24(3) (2022), 273--286	March 2021

	Indexed by Web of Science and Scopus	
<i>A (p, q)-Analogue of the Qi Formula for r-Dowling Numbers</i> Roberto Corcino, Joy Antonette Cillar, Charles Montero and Maribeth Montero	Published <i>Southeast Asian Bulletin of Mathematics</i> Volume 45 (2021), 29–42 (ISI/Scopus-Indexed Journal)	
<i>Higher Order Apostol-Type Poly-Genocchi Polynomials with Parameters a, b and c</i> Cristina B. Corcino Roberto B. Corcino	Published Online <i>Communication of the Korean Mathematical Society</i> https://ckms.kms.or.kr Indexed by Web of Science and SCOPUS	April 2021
<i>Translated Logarithmic Lambert Function and its Applications to Three-Parameter Entropy</i> Cristina B. Corcino and Roberto B. Corcino	Published <i>European Journal of Pure and Applied Mathematics</i> Volume 14, No. 2, 2021, 506-520 Indexed by Web of Science and SCOPUS	May 2021
<i>Estimation, control and forecast of COVID-19 disease spread in Central Visayas, Philippines</i> Roberto B. Corcino, Allan Roy B. Elnar, Gibson T. Maglasang and Karl Patrick S. Casas	Published <i>The Palawan Scientist</i> Volume 13(1) (2021), pp. 114-131 Indexed by Web of Science	May 27, 2021
<i>Great Barrier Reef degradation, sea surface temperatures, and atmospheric CO₂ levels collectively exhibit a stochastic process with memory</i> Allan R. B. Elnar,	Published Online <i>Climate Dynamics</i> (2021) https://link.springer.com/article/10.1007%2Fs00382-021-05831-8?fbclid=IwAR1_oAbWUUIJaNsJwoosO3LvcQNupLmr-z6_OpXwEi0JceqPN2WGviFAH944	June 7, 2021

Christianly B. Cena, Christopher C. Bernido & M. Victoria Carpio-Bernido	Indexed by Web of Science and SCOPUS	
<i>On quantum Hall effect, Kosterlitz-Thouless phase transition, Dirac magnetic monopole, and Bohr-Sommerfeld quantization</i> Felix A Buot, Allan Roy Elnar, Gibson Maglasang and Roland Otadoy	Published <i>Journal of Physics Communications</i> Volume 5 (2021) 025007 Indexed by Web of Science and SCOPUS	February 19, 2021 (Not reported in the first quarter)
<i>Hankel Transform of the First Form (q,r)-Dowling Numbers</i> Roberto B. Corcino	Published <i>European Journal of Pure and Applied Mathematics</i> Volume 14, No. 3, 2021, 746-759 https://www.ejpam.com/index.php/ejpam/article/view/3953/1036 Indexed by Web of Science and SCOPUS	August 2021
<i>Asymptotic Approximations of Apostol-Genocchi Numbers and Polynomials</i> Cristina B. Corcino,	Published <i>European Journal of Pure and Applied Mathematics</i> Volume 14, No. 3, 2021, 666-684 https://www.ejpam.com/index.php/ejpam/article/view/3976/1030 Indexed by Web of Science and SCOPUS	August 2021
<i>Approximations of Tangent Polynomials, Tangent-Bernoulli and Tangent-Genocchi Polynomials in terms of Hyperbolic Functions</i> Cristina B. Corcino, Roberto B. Corcino, and Jay M. Ontolan	Published Journal of Applied Mathematics , Volume 2021 (2021), Article ID 8244000. Indexed by Web of Science (Clarivate Analytics, Category: SCIE) and Scopus	November 2021

<p><i>Fourier Expansion, Integral Representation and Explicit Formula at Rational Arguments of the Tangent Polynomials of Higher-Order</i></p> <p>Cristina B. Corcino, Roberto B. Corcino, Jeremar Casquejo</p>	<p>Published</p> <p>European Journal of Pure and Applied Mathematics Volume 14(4) (2021), 1457-1466.</p> <p>Indexed by Web of Science (Clarivate Analytics, Category: ESCI)</p>	<p>November 2020</p>
<p><i>On Poly-Euler Polynomials and Arakawa-Kaneko Type Zeta Functions of Parameters a, b, c</i></p> <p>Cristina B. Corcino Roberto B. Corcino</p>	<p>Published</p> <p>Communications in Mathematics and Applications Volume 12(3) (2021), 401-415</p> <p>Indexed by Web of Science (Clarivate Analytics, Category: ESCI)</p>	
<p><i>Hankel Transform of the Type 2 (p, q)-Analogue of r-Dowling Numbers</i></p> <p>Roberto Corcino, Amerah Dibagulun, Mary Ann Ritzell Vega</p>	<p>Published</p> <p>Axioms Volume 10(4) (2021), Article 343</p> <p>Indexed by Web of Science (Clarivate Analytics, Category: SCIE) and Scopus</p>	<p>December 2021</p>
<p><i>Asymptotic Approximation of the Apostol-Tangent Polynomials Using Fourier Series</i></p> <p>Cristina B. Corcino, Baby Ann Damgo, Joy Ann Cañete Roberto B. Corcino,</p>	<p>Completed</p> <p>Accepted for Publication</p> <p>Symmetry</p> <p>Indexed by Web of Science (Clarivate Analytics, Category: SCIE) and Scopus</p>	<p>December 2021</p>
<p><i>Integral Representation and Explicit Formula at Rational Arguments for Apostol-Tangent Polynomials</i></p> <p>Cristina B. Corcino, Baby Ann Damgo, Joy Ann Cañete Roberto B. Corcino,</p>	<p>Completed</p> <p>Accepted for Publication with Minor Revision</p> <p>Symmetry</p> <p>Indexed by Web of Science (Clarivate Analytics, Category: SCIE) and Scopus</p>	<p>December 2021</p>

<p><i>Asymptotic Approximations of Apostol-tangent Polynomials in terms of Hyperbolic Functions</i></p> <p>Cristina B. Corcino, Wilson D. Castañeda, Jr. Roberto B. Corcino</p>	<p>Completed</p> <p>Accepted for Publication with Minor Revision</p> <p>Computer Modeling in Engineering and Sciences</p> <p>Indexed by Web of Science (Clarivate Analytics, Category: SCIE)</p>	<p>December 2021</p>
<p><i>Fourier Series for the Tangent Polynomials, Tangent-Bernoulli and Tangent-Genocchi Polynomials of Higher Order</i></p> <p>Cristina B. Corcino, Roberto B. Corcino</p>	<p>Completed</p> <p>Submitted for Publication</p> <p>Axioms</p> <p>Indexed by Web of Science (Clarivate Analytics, Category: SCIE) and Scopus</p>	<p>December 2021</p>

- The institute director, chairs, and researchers have earned the following citation records:

Name	H-Index	i10-index	Number of Citations
Dr. Roberto B. Corcino	14	18	559 (75 Citations in 2021)
Dr. Cristina B. Corcino	9	8	240 (29 Citations for 2021)
Dr. Edward Kiunisala	5	3	76 (13 Citations for 2021)
Mr. Jay M. Ontolan	3	0	27 (9 Citations for 2021)
Mr. Allan Roy Elnar	2	1	14 (2 Citations for 2021)
Dr. Cris Armada	3	0	17 (10 Citations for 2021)

- Awards received by RICMP Director and Researchers:

Name of Awards	Awardee/s	Date Awarded
<i>Presidential Citations 2021 for Outstanding Performance in the Delivery of Instruction</i>	Dr. Roberto B. Corcino	April 29, 2021

<i>Presidential Citations 2021 for Significant Contribution in the Achievement of University's Strategic Directions as Director of RICMP</i>	Dr. Roberto B. Corcino,	April 29, 2021
<i>Presidential Citations 2021 for Publication in International Journal Indexed by Web of Science and Scopus</i>	Dr. Roberto B. Corcino,	April 29, 2021
<i>Presidential Citations 2021 for Achieving the H-Index Citation Based on Google Scholar Metrics on Productivity and Citation Impact</i>	Dr. Roberto B. Corcino,	April 29, 2021
<i>Presidential Citations 2021 for Successful Implementation of Extension Project</i>	Dr. Roberto B. Corcino,	April 29, 2021
<i>3rd Place in Research Informercial Competition</i> Virtual Research Congress 2021 held on October 27-29, 2020 via Zoom Webinar Title of Entry: <i>Fourier Transform</i>	Dr. Cristina B. Corcino, Dr. Roberto B. Corcino, and Mr. Wilson Castañeda	October 29, 2021

- The institute has two (2) externally funded research projects, which officially started on June 3, 2019. Below are the said research projects funded by CHED-GIA.

Title of the Research Project	Status	Funding Agency/Project Cost
<i>HANKEL TRANSFORM OF q-ANALOGUE OF r-DOWLING NUMBERS</i> <i>by Roberto B. Corcino, Jay M. Ontolan</i>	Completed 1) Terminal Report and Liquidation Report have already been submitted to CHED; 2) Produced 9 papers published in international journals indexed by Web of Science and Scopus;	CHED-GIA Project Cost: PhP 2,457,961.10
	Completed	CHED-GIA

<p><i>THE GENERALIZED LAMBERT W FUNCTION, ITS PROPERTIES AND APPLICATIONS</i> <i>by Cristina B. Corcino, Roberto B. Corcino, Wilson Castañeda and Istvan Mezo</i></p>	<p>1) Terminal Report and Liquidation Report have already been submitted to CHED;</p> <p>2) Produced 8 papers published in international journals indexed by Web of Science and Scopus;</p>	<p>Project Cost: PhP 3,142,038.90</p>
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- The institute has submitted full-blown research program proposal to CHED (Phase 2 of the recently completed research Program funded by CHED-GIA). Table below provides the details of the proposed research program;

Title of the Proposed Research Program	Status	Proposed Budget
<p><i>RESEARCH TRENDS FOR COMPUTATIONAL MATHEMATICS AND STATISTICS (PHASE II)</i></p> <p>Program Leader: <i>Dr. Roberto B. Corcino RICMP Director</i></p> <p>PROJECT COMPONENT 1: <i>Maximum q-Entropy in Macroecology</i></p> <p>Project Leader: <i>Dr. Roberto B. Corcino RICMP Director Faculty CNU Mathematics Department</i></p> <p>Co-Project Leader: <i>Dr. Cristina B. Corcino RICMP Researcher CAS Research Chair Faculty CNU Mathematics Department</i></p>	<p>Submitted Concept Note to CHED-GIA</p>	<p>Proposed Program Cost: PhP 7,035,202.44</p> <p>Breakdown: Project Component 1 Cost is Php2,330,787.48 Project Component 2 Cost is Php2,257,707.48 Project Component 3 Cost is Php2,446,707.48</p> <p>Proposed Project Cost: Php2,330,787.48</p>

Co-Investigator:
Dr. Jay Picardal
RITPBP Director
Faculty CNU Biology
Department

PROJECT COMPONENT 2:
Nonextensive Entropy Applied
to Classical Gas Model

Project Leader:
Dr. Cristina B. Corcino
RICMP Researcher
CAS Research Chair
Faculty CNU Mathematics
Department

Co-Project Leader:
Dr. Roberto B. Corcino
RICMP Director
Faculty CNU Mathematics
Department

Co-Investigator:
Mr. Allan Roy Elnar
RICMP Division Chair
Faculty CNU Physics
Department

PROJECT COMPONENT 3:
Asymptotic Approximations of
the Tangent Polynomials and
Frobenius-Euler Polynomials
of Complex Order

Project Leader:
Dr. Cristina B. Corcino
RICMP Researcher
CAS Research Chair
Faculty CNU Mathematics
Department

Co-Project Leader:
Dr. Roberto B. Corcino
RICMP Director

Proposed Project Cost:
Php2,257,707.48

<i>Faculty CNU Mathematics Department</i> Co-Investigator: <i>Mr. Jay M. Ontolan RICMP Division Chair Faculty CNU Mathematics Department</i> Co-Investigator: <i>Mr. Wilson Castañeda Math Faculty of Cebu Technological University</i>		Proposed Project Cost: Php2,446,707.48
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- The institute has ten (10) on-going research projects funded by CNU-RICMP and one (1) research project funded by CNU-CRD. Table below provides status of the research project.

Title of the Research Project	Researchers	Status	Funding Agency/Project Cost
<i>Forcing Clique Domination Number of Graphs</i>	Cris L. Armada and Edward M. Kiunisala	Completed On the process of writing the Terminal Report	CNU-RICMP Project Cost: PhP 200,000.00
<i>Asymptotic Approximations of Tangent Polynomials in Terms of Hyperbolic Functions</i>	Cristina B. Corcino, Roberto B. Corcino, and Jay M. Ontolan	Completed Published one paper in the <i>Journal of Applied Mathematics,</i> <i>an international journal indexed by Web of Science and Scopus</i> On the process of writing the Terminal Report	CNU-RICMP Project Cost: PhP 200,000.00
<i>Fourier Series of Higher- Order Tangent Polynomials</i>	Cristina B. Corcino and Roberto B. Corcino	Completed	CNU-RICMP

		Submitted one paper for publication in ISI/Scopus-indexed journal On the process of writing the Terminal Report	Project Cost: PhP 200,000.00
<i>Asymptotic Approximation of the Apostol-Tangent Polynomials using Hyperbolic Functions</i>	Cristina B. Corcino and Roberto B. Corcino	Completed Produced one paper accepted for publication in Computer Modeling in Engineering and Sciences, an international journal indexed by Web of Science (SCIE) On the process of writing the Terminal Report	CNU-RICMP Project Cost: PhP 200,000.00
<i>Asymptotic Approximation of the Apostol-Tangent Polynomials using Fourier Series</i>	Cristina B. Corcino and Roberto B. Corcino	Completed Produced one paper accepted for publication in Symmetry, an international journal indexed by Web of Science (SCIE) and Scopus On the process of writing the Terminal Report	CNU-RICMP Project Cost: PhP 200,000.00
<i>Integral Representations and Explicit Formulas at Rational Arguments for Tangent Polynomials of Higher Order</i>	Cristina B. Corcino and Roberto B. Corcino	Completed	CNU-RICMP Project Cost: PhP 200,000.00

		<p>Published one paper in the <i>European Journal of Pure and Applied Mathematics</i>, an international journal indexed by Web of Science and Scopus</p> <p>On the process of writing the Terminal Report</p>	
<p><i>Integral Representations and Explicit Formulas at Rational Arguments for Apostol-Tangent Polynomials</i></p>	<p>Cristina B. Corcino and Roberto B. Corcino</p>	<p>Completed</p> <p>Produced one paper accepted for publication in <i>Symmetry</i>, an international journal indexed by Web of Science (SCIE) and Scopus</p> <p>On the process of writing the Terminal Report</p>	<p>CNU-RICMP Project Cost: PhP 200,000.00</p>
<p><i>Asymptotics of Tangent Polynomials and Higher Order Tangent Polynomials</i></p>	<p>Cristina B. Corcino and Roberto B. Corcino</p>	<p>Completed</p> <p>Submitted one paper for publication in ISI/Scopus-indexed journal</p> <p>On the process of writing the Terminal Report</p>	<p>CNU-RICMP Project Cost: PhP 108,400.00</p>
<p><i>Notes on the Two-Parameter Tsallis Distribution and the Stationary State Fokker - Planck Equation</i></p>	<p>Allan Roy B. Elnar, Gibson T. Maglasang, Karl Patrick S. Casas,</p>	<p>Completed</p>	<p>CNU-RICMP Project Cost: PhP 100,000.00</p>

	and Clare Maristela Galon	Submitted one paper for publication in ISI/Scopus-indexed journal On the process of writing the Terminal Report	
<i>Economic SIRD (e-SIRD) model of COVID19 pandemic in the Philippines</i>	Allan Roy B. Elnar, Gibson T. Maglasang, Karl Patrick S. Casas, And Clare Maristela Galon	Completed Submitted one paper for publication in ISI/Scopus-indexed journal On the process of writing the Terminal Report	CNU-RICMP Project Cost: PhP 100,000.00
<i>Apostol-Frobenius-Type Poly-Genocchi Polynomials with Parameters a, b and c</i>	Roberto B. Corcino and Cristina B. Corcino	Completed Published one paper in the <i>European Journal of Inequalities and Special Functions, an international journal indexed by Web of Science</i> On the process of writing the Terminal Report	CNU-CRD Project Cost: PhP 123,385.65

- The Institute Director, Dr. Roberto B. Corcino, has been a collaborator of two (2) externally funded research projects (dissertation researches of his two (2) PhD advisees), working with Dr. Mary Ann P. Vega (MSU-IIT Math Professor) as co-adviser. Below are the said research projects funded by CHED and DOST.

Title of the Research Project	Status	Funding Agency/Project Cost
<p><i>A Q-Analogue of Genralized Translated Whitney Numbers and Translated R-Whitney-Lah Numbers: Cigler’s Approach</i></p> <p>by Roberto B. Corcino, Jezer C. Fernandez and Mary Ann Ritzell P. Vega</p>	<p>Obtained all expected results</p> <p>Published one paper in the <i>Journal of Mathematics and Computer Science</i> Volume 24 (2022), 82–96 (Indexed by Web of Science and Scopus)</p> <p>Completed</p>	<p>DOST Project Cost: PhP 60,000.00</p>
<p><i>A (p,q)-Analogue of the r-Dowling Numbers and Their Hankel Transforms</i></p> <p>by Roberto B. Corcino, Amerah M. Dibagulun and Mary Ann Ritzell P. Vega</p>	<p>Obtained all expected results</p> <p>Published two papers in ISI/Scopus-indexed journal</p> <p>a) <i>Journal of Mathematics and Computer Science</i> Volume 24 (2022), 82–96</p> <p>b) <i>Axioms Volume 10(4)</i> (2021), Article 343</p> <p>Completed</p>	<p>DOST Project Cost: PhP 60,000.00</p>

➤ International Research Collaborations/Linkages:

- a) Dr. Roberto B. Corcino (RICMP Director) has communicated Dr. Istvan Mezo (Research Professor of Nanjing University of Information Science and Technology, China) last March 13, 2021 inviting him to be the resource speaker of Lecture Series 2 and Research Training Workshop on Special Topics in Combinatorics and Special Functions, and to propose another research project for collaboration. Dr. Mezo has accepted the invitation.
- b) Dr. Roberto B. Corcino (RICMP Director) has communicated Dr. Ugur Duran (Faculty of Iskenderun Technical University, Turkey) last March 16, 2021 inviting him to have research collaboration. Dr. Duran has accepted the invitation.

➤ Consultancy Services:

- ✓ Dr. Roberto B. Corcino (RICMP Director) served as PANEL OF EVALUATOR in the presentation and evaluation of scientific papers during the 4th International STEAM Research Congress held on February 3-5, 2021 via Zoom.

- ✓ Dr. Roberto B. Corcino (RICMP Director) has been invited as resource speaker of the seminar titled “*Breakthroughs in Mathematics*” conducted by the Department of Mathematics and Computer Science, University of the Philippines Baguio, Baguio City on March 19, 2021 at 1pm.
- ✓ Dr. Roberto B. Corcino (RICMP Director) served as dissertation adviser of the following PhD Math students of MSU-IIT:
 1. **Mr. Jezer C. Fernandez (DOST Scholar)**
 Degree: *Doctor of Philosophy in Mathematics*
 School: *Mindanao State University-Iligan Institute of Technology*
 Dissertation Title: *A q-Analogue of Genralized Translated Whitney Numbers and Translated r-Whitney-Lah Numbers: Cigler’s Approach*
 Status: *Graduated July 8, 2021*
 2. **Ms. Amerah M. Dibagulun (DOST Scholar)**
 Degree: *Doctor of Philosophy in Mathematics*
 School: *Mindanao State University-Iligan Institute of Technology*
 Dissertation Title: *A p,q-Analogue of the r-Dowling Numbers and Their Hankel Transform*
 Status: *Passed the Final Oral Dissertation Defense on December 15, 2021*
- ✓ Dr. Roberto B. Corcino (RICMP Director) served as member of panel of experts during Curriculum Review of the BS Math Program of Surigao State College of Technology held on December 9-10, 2021 via Zoom.
- ✓ Dr. Roberto B. Corcino (RICMP Director) served as reviewer/referee of the following international journals indexed by Web of Science (Clarivate Analytics)/SCOPUS in the year 2021:
 - 1) FILOMAT
 - 2) Information Sciences
 - 3) Quaestiones Mathematicae
 - 4) Inteers
 - 5) Acta Mathematica Hiungarica
 - 6) Advances in Difference Equations
 - 7) Boletin de la Sociedad Matematica Mexicana
 - 8) Computer Modeling in Engineering and Sciences
 - 9) European Journal of Combinatorics
 - 10) AIMS Mathematics
 - 11) Symmetry
- The institute director, Dr. Roberto B. Corcino, has been elected for another three-year term as board member of the Mathematical Society of the Philippines Region VII Chapter (MSP Region VII) during the Business Meeting of MSP Region VII held on December 10, 2021 via Zoom.

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Received by:

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VP Research, Extension and Publication