

Minas Karapet Balyan

Research Institute of Physics

Laboratory of Solid State Physics

Senior researcher

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ℝ⁶

Education

Institution	Yerevan State University
Faculty	physics
Date	1975 - 1984
Degree name	PhD student

Scientific Rank/degree

Institution	Yerevan State University
Date	2017
Degree name	Doctor
Specialty	Physico-mathematical sciences
Research Topic	THEORY OF X-RAY DIFFRACTED WAVEFIELDS, DYNAMICAL COHERENT HOLOGRAPHY AND INTERFEROMETRY

Language skills

Հայերեն English Русский

Work experience

Institution	Yerevan State University
Period of time	1980 till now
Rank/degree	leading scientiphyk researcher

Scientific interests

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- X-ray dynamical diffraction, X-ray holography and interferometry, X-ray optics
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Membership

Institution	International union of crystallography
Period of time	1994 till now

Article

Double-slit X-ray dynamical diffraction in elastically deformed crystals

Minas K. Balyan

Acta Crystallographica A-Foundation and Advances 2025 294-305

Article

Double-Slit X-Ray Dynamical Diffraction in the Transmitted Beam [Рентгеновская динамическая дифракция на двух щелях в проходящем пучке]

A. P. Aivazyan, M. K. Balyan, S. A. Petrosyan, V. P. Mkrtchyan

Journal of Contemporary Physics (Armenian Academy of Sciences) 2025 101-107

Article

X-ray dynamical diffraction wavefront division interferometer (double-slit diffraction) with an asymmetric monochromator

Vahram Mkrtchyan, Minas Balyan, Sargis Petrosyan, Ashot Aivazyan

Acta Crystallographica A-Foundation and Advances 2025 438-448

Article

Double-slit asymmetrical dynamical diffraction of X-rays in ideal crystals

Minas Balyan

Acta Crystallographica A-Foundation and Advances 2024 161-166

Article

Measurements of the geometrical characteristics and refractive index of specimens made with X-ray interferometers

Vahram Mkrtchyan, Ashot Aivazyan, Sargis Petrosyan, Minas Balyan

Journal of Applied Crystallography 2024 499-502

Article

Diffraction Fields and Fields of Charges, Expressed in Terms of Hertz Vector in Electrodynamics

M. K. Balyan

Journal of Contemporary Physics (Armenian Academy of Sciences) 2023 92-98

Article

Double-slit X-ray dynamical diffraction in curved crystals

Minas K. Balyan

Acta Crystallographica A-Foundation and Advances 2023 353-359

Article

Vector Monochromatic Diffraction Fields and Fields of Charges in Electrodynamics

M. K. Balyan

Journal of Contemporary Physics (Armenian Academy of Sciences) 2023 188-192

Article

Electromagnetic Vector Monochromatic Diffraction Fields and Fields of Charges in Media

M.K.Balyan

Journal of Contemporary Physics (Armenian Academy of Sciences) 2023 251-256

Article

Vector Non-Stationary Electromagnetic Diffraction Fields and Fields of Charges in Media

M. K. Balyan

Journal of Contemporary Physics (Armenian Academy of Sciences) 2023 349-354

Article

Rocking Curves of X-Ray Asymmetrical Laue Diffraction in a Crystal with the Third-Order Nonlinear Response

M.K. Balyan

Journal of Contemporary Physics (Armenian Academy of Sciences) 2022 91-97

Article

X-ray third-order nonlinear diffraction in the asymmetric reflection geometry

Minas K. Balyan

Acta Crystallographica A-Foundation and Advances 2022 349-358

Article

Fields of Charges and Diffraction Fields in Electrodynamics

M.K.Balyan

Journal of Contemporary Physics (Armenian Academy of Sciences) 2022 331-341

Article

Coherence Requirements for X-Ray Dynamical Diffraction Talbot Effect Inside a Crystal

M. K. Balyan

Journal of Contemporary Physics (Armenian Academy of Sciences) 2021 55-59

Article

X-ray dynamical diffraction Talbot effect behind a crystal in free space

Minas Balyan, Levon Levonyan, Karapet Trouni

Acta Crystallographica A-Foundation and Advances 2021 149-159

Article

Hard X-Ray Off-Axis Fresnel Holography using Two-Block Fresnel Zone Plate Interferometer

L.A.Haroutunyan, M.K.Balyan

Journal of Contemporary Physics (Armenian Academy of Sciences) 2021 154-157

Article

X-ray third-order nonlinear asymmetric diffraction in the transmission geometry

M.K.Balyan

Physica Scripta 2021 125006 (21)

Article

X-Ray Dynamical Diffraction Analogue of Talbot Effect in Case of Incident Finite Front Wave

M.K.Balyan

Journal of Contemporary Physics (Armenian Academy of Sciences) 2020 70-76

Article

Testing of a 'hard' X-ray interferometer for experimental investigations

Tigran H. Eyrarmjyan, Mesrop H. Mesropyan, Tamara S. Mnatsakanyan, Minas K. Balyan

Acta Crystallographica A-Foundation and Advances 2020 390-394

Article

Investigation of third-order nonlinear dynamical X-ray diffraction based on a new exact solution

Minas K. Balyan

Journal of Synchrotron Radiation 2020 941-952

Article

РЕНТГЕНОВСКАЯ ФРЕНЕЛЕВСКАЯ ОСЕВАЯ ГОЛОГРАФИЯ С ИСПОЛЬЗОВАНИЕМ ТРЕХБЛОЧНОГО ИНТЕРФЕРОМЕТРА ИЗ ФРЕНЕЛЕВСКИХ ЗОННЫХ ПЛАСТИН

Л.А. АРУТЮНЯН, М.К. БАЛЯН

Известия НАН РА. Физика (Journal of Contemporary Physics (Armenian Academy of Sciences) 2020 378-386

Article

Spherical-wave X-ray dynamical diffraction Talbot effect inside a crystal

Minas K. Balyan, Levon V. Levonyan, Karapet G. Trouni

Acta Crystallographica A-Foundation and Advances 2020 494-502

Article

X-ray two-wave dynamical diffraction analogue of Talbot effect

M K Balyan

Journal of Optics 2019 055603(1-14)

Article

Dependence of X-ray asymmetrical Bragg case plane-wave rocking curves on the deviation from exact Bragg orientation in and perpendicular to the diffraction plane

Minas K. Balyan

Acta Crystallographica A-Foundation and Advances 2019 517-526

Article

An X-Ray Dynamical Diffraction Analogue of Talbot Effect in the Transmitted Beam

M.K.Balyan

Journal of Contemporary Physics (Armenian Academy of Sciences) 2019 253-261

Article

X-ray dynamical diffraction analogues of the integer and fractional Talbot effects

Minas K. Balyan

Journal of Synchrotron Radiation 2019 1650-1659

Article

Rocking Curves of X-ray Asymmetrical Laue Diffraction with Two-Dimensional Curvature of Wave Front

M. K. Balyan

Journal of Contemporary Physics (Armenian Academy of Sciences) 2018 85-91

<https://link.springer.com/article/10.3103/S1068337218010103>

Article

X-ray Fourier transform holography by amplitude-division-type Fresnel zone plate interferometer

Minas Balyan, Levon Haroutunyan

Article

Dependence of X-ray plane-wave rocking curves on the deviation from exact Bragg orientation in and perpendicular to the diffraction plane for the asymmetrical Laue case

Minas K. Balyan

Acta Crystallographica A-Foundation and Advances 2018 204-215

<https://onlinelibrary.wiley.com/doi/full/10.1107/S205327331800181X>

Article

Rocking Curves of X-Ray Asymmetric Bragg Diffraction with Two-Dimensional Curvature of Wave Front

M.K.Balyan

Journal of Contemporary Physics (Armenian Academy of Sciences) 2018 166-174

Article

Experimental and theoretical investigations of an X-ray LLL interferometer with a wedge-shaped mirror plate

Tigran H. Eyranyan, Tamara S. Mnatsakanyan, Minas K. Balyan

Acta Crystallographica A-Foundation and Advances 2018 595-599

Article

X-ray nonlinear Bragg diffraction

Minas K. Balyan

Journal of Nanophotonics 2017 016003-1 - 016-6

<https://spie.org/publications/journals/journal-of-nanophotonics>

Article

X-RAY THIRD-ORDER NONLINEAR RENNINGER EFFECT AND ROCKING CURVES

M.K.Balyan

Proceedings of the YSU A. Physical and Mathematical Sciences 2017 85-88

<http://www.ysu.am/science/en/journals>

Article

Rocking Curves in the Laue Geometry Depending on the Departure of Incident Plane X-ray Wave from the Bragg Condition in the Diffraction Plane and in the Direction Perpendicular to the Diffraction Plane

M.K.Balyan

Journal of Contemporary Physics (Armenian Academy of Sciences) 2017 102-109

<http://www.springer.com/physics/particle+and+nuclear+physics/journal/11958>

Article

X-Ray Interferometric Moire Fringes in the Presence of Temperature Gradient within the Frameworks of Eikonal Approximation

M.K.Balyan

Journal of Contemporary Physics (Armenian Academy of Sciences) 2017 161-166

<http://www.springer.com/physics/particle+and+nuclear+physics/journal/11958>

Article

X-ray interferometric Fresnel Holography

M.K.Balyan

Journal of Contemporary Physics (Armenian Academy of Sciences) 2016 79-88

<http://www.springer.com/physics/particle+and+nuclear+physics/journal/11958>

Article

Third-order nonlinear and linear time-dependent dynamical diffraction of X-rays in crystals

Minas K.Balyan

Journal of Synchrotron Radiation 2016 919-928

<http://journals.iucr.org/s/>

Article

Рентгеновская интерферометрическая Фурье-голография

М.К.Балян

Известия НАН РА. Физика (Journal of Contemporary Physics (Armenian Academy of Sciences) 2016 388-401

<http://www.flib.sci.am/eng/Fizika/Frame.html>

Article

X-ray third-order nonlinear plane-wave Bragg-case dynamical diffraction effects in a perfect crystal. Erratum

Minas K.Balyan

Journal of Synchrotron Radiation 2016 1272-1272

<http://journals.iucr.org/s/>

Article

Diffraction of X-ray spatially inhomogeneous beam in a crystal with cubic nonlinearity

M.K.Balyan

Journal of Contemporary Physics (Armenian Academy of Sciences) 2016 391-397

<http://www.springer.com/physics/particle+and+nuclear+physics/journal/11958>

Article

X-ray Plane-Wave Diffraction Effects in a Crystal with Third-Order Nonlinearity

M.K.Balyan

Crystallography Reports 2016 1039-1046

<http://link.springer.com/journal/11445>

Article

X-ray Interferometric Fourier Holography

M.K.Balyan

Journal of Contemporary Physics (Armenian Academy of Sciences) 2016 289-298

<http://www.springer.com/physics/particle+and+nuclear+physics/journal/11958>

Article

Bragg diffraction of spherical X-ray wave with allowance for two-dimensional curvature of wavefront

M.K.Balyan

Journal of Contemporary Physics (Armenian Academy of Sciences) 2015 134-143

<http://www.springer.com/physics/particle+and+nuclear+physics/journal/11958>

Article

X-ray third-order nonlinear plane-wave Bragg-case dynamical diffraction effects in a perfect crystal

Minas K.Balyan

Journal of Synchrotron Radiation 2015 1410-1418

<http://journals.iucr.org/s/>

Article

X-ray crystall-diffraction Fourier holography

M.K.Balyan

Journal of Contemporary Physics (Armenian Academy of Sciences) 2015 394-403

<http://www.springer.com/physics/particle+and+nuclear+physics/journal/11958>

Article

X-ray third-order nonlinear dynamical diffraction of X-rays in a crystal

M.K.Balyan

Crystallography Reports 2015 993-1000

<http://link.springer.com/journal/11445>

Article

Numerical reconstruction of an object image using an X-ray dynamical diffraction Fraunhofer hologram

Minas K.Balyan

Journal of Synchrotron Radiation 2014 127-130

<http://journals.iucr.org/s/>

Article

Object image correction using an X-ray dynamical diffraction Fraunhofer hologram

Minas K.Balyan

Journal of Synchrotron Radiation 2014 449-451

<http://journals.iucr.org/s/>

Article

X-ray Laue diffraction with allowance for second derivatives of amplitudes in dynamical diffraction equations

M.K.Balyan

Journal of Contemporary Physics (Armenian Academy of Sciences) 2014 130-141

<http://www.springer.com/physics/particle+and+nuclear+physics/journal/11958>

Article

X-ray Bragg diffraction with allowance for the second derivatives of amplitudes in the dynamical diffraction equations

M.K.Balyan

Journal of Contemporary Physics (Armenian Academy of Sciences) 2014 284-294

<http://www.springer.com/physics/particle+and+nuclear+physics/journal/11958>

Article

Theoretical consideration of an X-ray Bragg-reflection lens using the eikonal approximation

Minas K.Balyan

Journal of Synchrotron Radiation 2014 700-707

Article

X-ray Laue diffraction with allowance for two-dimensional curvature of wave front: the concept of locally plane wave

M.K.Balyan

Journal of Contemporary Physics (Armenian Academy of Sciences) 2014 446-450

<http://www.springer.com/physics/particle+and+nuclear+physics/journal/11958>

Article

Measurement of the refractive index of nematic liquid crystals 5CB by means of x-ray interferometry

Mkrtchyan V. P., Gasparyan L. G., Dadalyan T. K., Balyan M. K., Kuyumchyan A. V.

Proceedings of SPIE - The International Society for Optical Engineering 2014 920714

<http://spie.org/publications/conference-proceedings>

Article

Transport equations of amplitudes in the eikonal approximation of dynamical diffraction equations

M.K.Balyan

Journal of Contemporary Physics (Armenian Academy of Sciences) 2013 46-50

<http://www.springer.com/physics/particle+and+nuclear+physics/journal/11958>

Article

Eikonal approximation of dynamical diffraction equations for X-ray beams with two dimensional curvature of the wave-front. I. Basic formulas

M.K.Balyan

Journal of Contemporary Physics (Armenian Academy of Sciences) 2013 144-146

<http://www.springer.com/physics/particle+and+nuclear+physics/journal/11958>

Article

Eikonal approximation of dynamical diffraction equations for X-ray beams with a two dimensional curvature of the wave front . II. Focusing of an X-ray beam by a crystal with non-plane entrance and exit surfaces. Symmetrical Laue case.

M.K.Balyan

Journal of Contemporary Physics (Armenian Academy of Sciences) 2013 247-252

<http://www.springer.com/physics/particle+and+nuclear+physics/journal/11958>

Article

X-ray dynamical diffraction Fraunhofer holography

Mlinas K.Balyan

Journal of Synchrotron Radiation 2013 749-755

<http://journals.iucr.org/s/>

Article

Eikonal approximation in the theory of X-ray interferometer

M.K.Balyan

Journal of Contemporary Physics (Armenian Academy of Sciences) 2012 241-247

<http://www.springer.com/physics/particle+and+nuclear+physics/journal/11958>

Article

X-ray zone plates in combination with diffraction reflection

M.K.Balyan, A.H.Grigoryan, A.H.Toneyan

Journal of Contemporary Physics (Armenian Academy of Sciences) 2011 130-134

<http://www.springer.com/physics/particle+and+nuclear+physics/journal/11958>

Article

Study of the X-ray anisotropy of materials via X-ray interferometry

V.P.Mkrtchyan, L.G.Gasparyan, M.K.Balyan

Inorganic Materials 2011 1676-1680

<http://link.springer.com/journal/10789>

Article

X-ray focusing by the system of lens(es) placed inside asymmetric channel-cut crystals

Minas K.Balyan, Arshak H.Grigoryan, Albert H.Toneyan

Journal of Synchrotron Radiation 2010 332-347

<http://journals.iucr.org/s/>

Article

Double slit dynamical diffraction of X-rays in ideal crystals (Laue case)

Minas K. Balyan

Acta Crystallographica A-Foundation and Advances 2010 660-668

<http://journals.iucr.org/a/>

Article

Исследование рентгено-оптической анизотропии материалов рентгеноинтерферометрическим методом

Л.Г.Гаспарян, В.П.Мкртчян, М.К.Балян

Заводская лаборатория. Диагностика материалов. 2010 27-31

Article

Искусственная ультразвуковая анизотропия кристаллов в области рентгеновских частот

Л.Г. Гаспарян, В.П. Мкртчян, М.К. Балян, А.С. Мелконян

Известия НАН РА. Физика (Journal of Contemporary Physics (Armenian Academy of Sciences) 2007 242-249

Article

Модуляция рентгеновского пучка на основе модуляции кристаллической решетки

М.К.Балян, Л.А.Арутюнян

Известия НАН РА. Физика (Journal of Contemporary Physics (Armenian Academy of Sciences) 2006 50-55

<http://www.flib.sci.am/eng/Fizika/Frame.html>

Article

Температурная искусственная анизотропия кристаллов в области рентгеновских частот

Л.Г. Гаспарян, В.П. Мкртчян, М.К. Балян, А.Г. Григорян

Известия НАН РА. Физика (Journal of Contemporary Physics (Armenian Academy of Sciences) 2006 374-378

Article

О возможности создания новой дифракционно-рефракционной линзы для жесткого рентгеновского излучения

М.К.Балян, Л.Г.Гаспарян, А.Г.Григорян, М.М.Агасян

Известия НАН РА. Физика (Journal of Contemporary Physics (Armenian Academy of Sciences) 2004 262-264

<http://www.flib.sci.am/eng/Fizika/Frame.html>

Article

X-ray Diffraction Investigations of Microstructure of calcium Hydroxide Crystallites in the Interfacial Transition Zone of Concrete

Valeri S.Harutyunyan, Vahram P.Mkrtchyan, Minas K.Balyan, Ashot P.Aivazyan, Eduard S. Abovyan,

Paulo J.M.Monteiro

Journal of the American Ceramic Society 2003 2162-2166

[http://onlinelibrary.wiley.com/journal/10.1111/\(ISSN\)1551-2916](http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1551-2916)

Article

Micro strain distribution in calcium hydroxide present in the interfacial transition zone

V.S.Harutyunyan, V.P.Mkrtchyan, M.K.Balyan, E.S.Abovyan, P.J.M.Monteyro

Cement and Concrete Research 2000 709-713

<http://www.journals.elsevier.com/cement-and-concrete-research>

Article

Усовершенствованная теория дифракции рентгеновских волн в условиях зеркального отражения

М.К.Балян, Л.В.Левонян

Известия НАН РА. Физика (Journal of Contemporary Physics (Armenian Academy of Sciences) 2000 309-319

<http://www.flib.sci.am/eng/Fizika/Frame.html>

Article

Влияние внешних воздействий на Брэгг-Лауэвскую дифракцию рентгеновских лучей

Л.Г.Гаспарян, В.П. Мкртчян, А.Г. Григорян, М.К.Балян, С.А. Валасанян

Известия НАН РА. Физика (Journal of Contemporary Physics (Armenian Academy of Sciences) 2000 28-37

Article

Исследование особенностей дифракции X-лучей в сочетаниях Брэгг-Лауэвских отражений

Л.Г.Гаспарян, В.П.Мкртчян, М.К.Балян, А.Г.Григорян, С.А.Валасанян

Известия НАН РА. Физика (Journal of Contemporary Physics (Armenian Academy of Sciences) 1999 162-171

<http://www.flib.sci.am/eng/Fizika/Frame.html>

Article

Интерпретация электронно-микроскопических решеточных полос

М.К.Балян, А.М.Арустамян, К.Т.Габриелян

Кристаллография (Crystallography Reports) 1995 18-20

<http://www.maik.ru/ru/journal/krist/>

Article

Электронно-микроскопические картины муара слабдеформированных кристаллов

М.К.Балян, К.Т.Габриелян

Известия НАН РА. Физика (Journal of Contemporary Physics (Armenian Academy of Sciences) 1994

82-89

<http://www.flib.sci.am/eng/Fizika/Frame.html>

Article

О возможности создания короткофокусной вертикально фокусирующей рентгенодифракционной линзы

Л.В.Левонян, М.К.Балян

Письма в журнал технической физики (Technical Physics Letters) 1993 47-50

<http://journals.ioffe.ru/journals/editors/4>

Article

Two -dimensional diffraction focusing of X-ray Radiation in Laue Geometry

L.V.Levonyan, M.K.Balyan

PHYSICA STATUS SOLIDI A-APPLICATIONS AND MATERIALS SCIENCE 1993 247-255

[http://onlinelibrary.wiley.com/journal/10.1002/\(ISSN\)1862-6319/homepage/2231_ed...](http://onlinelibrary.wiley.com/journal/10.1002/(ISSN)1862-6319/homepage/2231_ed...)

Article

Влияние кристаллических искажений на образование и вид маятниковых полос, I

Алумян К.В., Багдасарян Р.И., Балян М.К.

Кристаллография (Crystallography Reports) 1983 1024-1025

http://elibrary.ru/title_about.asp?id=7861

Article

Влияние кристаллических искажений на образование и вид маятниковых полос, II

Балян М.К., Алумян К.В., Багдасарян Р.И.

Кристаллография (Crystallography Reports) 1983 1026-1027

<http://www.maik.ru/ru/journal/krist/>

Conference

X-ray interferometric temperature gradient moire fringes in the frame of eikonal approximation

Minas Balyan

Conference

X-ray nonlinear Bragg diffraction

Minas Balyan

Conference

X-Ray Dynamical Diffraction 'Third Order Nonlinear Renninger Effect'

Minas Balyan

Conference

Mathematical Reconstruction of an Object Image Using X-Ray Interferometric Fourier Holography Method

M.K.Balyan

Conference

X-Ray Dynamical Diffraction Rocking Curves in Case of Third Order Nonlinear Renninger

Effect

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Conference

Mathematical reconstruction of an object image using X-ray interferometric Fourier holography method

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Conference

Measurement of the Refractive Index of Nematic Liquid Crystals 5CB by Means of X-ray Interferometry

V.P.Mkrtchyan, L.G.Gasparyan, T.K.Dadalyan, M.K.Balyan, A.V.Kuyumchyan

Conference

X-ray dynamical diffraction Talbot effect under the condition of two-wave dynamical diffraction in crystals

M.K.Balyan

Conference

X-ray LLL interferometer with wedge-shaped mirror plate

Tigran H. Eyrarnjyan, Tamara S. Mnatsakanya, Minas K. Balyan

Conference

Hard X-Ray Fourier Transform Holography Based on Two-Block Fresnel Zone Plate Interferometer with Common Optical Axis

L.A. Haroutunyan, M.K.Balyan

Conference

Double-Slit X-ray Dynamical Diffraction in the Transmitted and Diffracted Beams

A. P. Aivazyan, M. K. Balyan, S. A. Petrosyan, V. P. Mkrtchyan
