BIOGRAPHICAL SKETCH

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NAME: Terán Bobadilla, Emiliano

eRA COMMONS USER NAME (credential, e.g., agency login): eteran

POSITION TITLE: Research Associate Professor, School of Physical-Mathematical Sciences, and Assistant Professor, Optometry School, Autonomous University of Sinaloa

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Autonomous University of Sinaloa Culiacán, Sinaloa, México	BSc (Hons)	2002	Physics
Center for Scientific Research and Higher Education at Ensenada, Ensenada, BC. México	MSc	2005	Optics of biological systems
Center for Scientific Research and Higher Education at Ensenada, Ensenada, BC. México	PhD	2010	Optics of biological systems

A. Personal Statement

I received a bachelor's degree in Physics. Then, I decided to obtain a postgraduate degree in optics because I believed it could help me to have a real impact on society. This led me to choose a research topic related to the coral bleaching. This was a great challenge for me, because I had no experience working with corals, nor with the sophisticated methods required to study such a complex optical system (Monte Carlo methods). However, we were able to achieve a good optical model of the absorption of corals. I was awarded a PhD from the Department of Optics, Center for Scientific Research and Higher Education at Ensenada. The thesis was titled “Consequences of Multiple Scattering on the Absorption of Some Biological Systems”.

When I was appointed as an Assistant Professor in the School of Optometry I started to develop a strong interest in vision research and clinical research. My first clinical research experience, I worked on a project about glaucoma in collaboration with Dr. Russell L. Woods from the Schepens Eye Institute in Boston, Massachusetts. There, we examined whether narrative description (ND) can be affected by glaucoma in subjects in Culiacán. In that study, I learned how a clinical study should be conducted. Since then, I have developed small clinical projects on my own, usually consulting with Dr. Woods, who is became my mentor.

B. Positions and Honors

Positions and Employment

2005-2009 Assistant Professor, Engineering School, Autonomous University of Baja California, Mexico
2010 Field Research Assistant, Center of Investigation on Polymers-COMEX, project: Propagation of light in optically inhomogeneous and non-uniform films.
2011-present Research Associate Professor, School of Physical-Mathematical Sciences, Autonomous University of Sinaloa, Sinaloa, Mexico
2012-present Assistant Professor, Optometry School, Autonomous University of Sinaloa, Sinaloa, Mexico

Awards

2002 MSc Scholarship (National Council for Science and Technology, Mexico)

2005	PhD Scholarship (National Council for Science and Technology, Mexico).
2012	Member of the National System of Researchers (Mexico)
2013	Recognition as a Teacher with Desirable Profile by the Secretary of Public Education (Mexico)
2015	National Award for the best poster at the Annual Meeting of the Mexican Society of Physics: *Analysis of opacity of the lens through the Monte Carlo method*
2017	Collaborative Research Fellowship from ARVO Foundation for Eye Research.
2018	Accepted in the ARVO's Global Mentorship Program.

Leadership roles

2019-2022	Co-Chair of the Education Committee of the Latin America Association of Optometry and Optics (ALDOO in Spanish)
2022	Regional Representative of the Latin American Region in the Education Committee of the World Council of Optometry.
2021-Currently	Regional Representative of the Latin American Region for VOSH/International.
2021-2022	Former Secretary of the Lions Club, named the Culiacan AC Lions Club.
2022-2023	Current President of the Lions Club, named the Culiacan AC Lions Club.

C. Contributions to Science

1. Effects of light on corals

Coral reefs are one of the most important ecosystems on Earth. Important because coral reefs produce more oxygen than trees. Coral bleaching is one the principal causes of death of the coral reefs. My investigation developed an optical model to calculate the absorption and scattering properties of coral reefs. This model allowed us to establish the important role of the scattering of light by the coral skeleton. This feature was unknown before our study.

a) **Teran, E**., Méndez ER, Enríquez, S, and Iglesias-Prieto R. (2010). Multiple light scattering and absorption in reef-building corals. *Applied Optics*, 49(27): 5032-5042. doi: https://doi.org/10.1364/AO.49.005032.
b) **Teran, E.** (2011) Esparcimiento de luz y blanqueamiento de corales. Editorial Académica Española, ISBN: 978-3-8454-8709-03.
c) **Teran E**, Mendez E. (2015) Random flights in turbid media with non-uniform optical properties. *Laser Science*, JTu4A. 12.

2. Light and dielectric interfaces

An important aspect of my work has been to develop experimental methods to measure the optical properties (absorption, reflectance and transmittance) of materials. One topic I have been studying is the detection and generation of diffuse (non-coherent) light of the visible spectrum.

a) Gonzalez-Alcalde AK, Mendez ER, Cuppo FL, Olivares JA, **a) Terán E**. (2012) Interaction of diffuse light with rough dielectric interfaces. *Frontiers in Optics*, OSA annual meeting. FW3A. 21.
b) **Terán, E**. (2011) El método Monte Carlo y la propagación de luz en medios no homogeneous. Editorial Académica Española, ISBN: 978-3- 8454-9746
c) **Terán, E**, Méndez E (2015) A study of the fluctuations of the optical properties of a turbid media through Monte Carlo method. *arXiv preprint* arXiv:1507.01522.
d) **Terán E**, Méndez E (2015) Novel method to obtain the anisotropic parameter of microcells. *arXiv preprint* arXiv:1507.01528
e) González-Alcalde AK, Méndez ER, **Terán, E**, Cuppo FL, Olivares JA and García-Valenzuela A, (2016). Reflection of diffuse light from dielectric one-dimensional rough surfaces. *J Opt Soc Am A*, 33(3): 373-382. doi: https://doi.org/10.1364/JOSAA.33.000373.
f) **Terán, E**., Méndez-Méndez, E.R., Quispe-Siccha, R., Peréz-Pacheco, A. and Cuppo, F.L.S., (2019). Application of single integrating sphere system to obtain the optical properties of turbid media. *OSA Continuum*, *2*(5), pp.1791-1806.

3. Analysis of the Bacubirito meteorite

The Bacubirito meteorite is the fifth largest of the world and the biggest in Mexico. Meteorites bring information about the universe that can not be obtained otherwise. For example, meteorites have allowed us to calculate the age of the planetary system and to have indirect samples from the center of the Earth. The Bacubirito meteorite is located in Culiacan, my current location. I started to study this specimen due to the lack of scientific studies about this huge meteorite. We have succeeded not only measuring accurately its mass, but also establishing that it is the longest meteorite in the world (4.1m).

a) **Teran, E**, Abundis-Patiño JH, Añorve C, Moraila CR, Ortega-Gutiérrez F and Aragón-Calvo MA, (2017). On a Novel Geometric Analysis of the Bacubirito Meteorite. *Earth, Moon, and Planets*, 120(2): 101-111. doi: https://doi.org/10.1007/s11038-017-9507-8
b) **Teran, E**, Abundis-Patiño JH, Añorve C, Moraila CR, Ortega-Gutiérrez F. (2018) Bacubirito: The longest meteorite of the world. *Astronomy and Geophysics*. 59.2: 2-30.
c) **Teran, E** (2019) Bacubirito: an outstanding cosmic sample on Earth. Chapter of the Book: *Geospatial Analyses of Earth Observation (EO)*. DOI: 10.5772/intechopen.88831

4. Human eye

The work I am developing to study the human eye seeks to develop experimental and theoretical tools that can help us to evaluate patient's ocular and visual health more reliably and accurately. In particular, I am interested in developing experiments where optometrists, ophthalmologists and other areas of science (such as physics or computer science) can collaborate.

a) **Teran, E**, Molina-Reyes D, Martinez-Gaytan R-J. (2018) On the smartphone's light emission and its blue light contribution. *ARVO Annual Meeting,* Honolulu, HI.
b) **Teran, Emiliano**; Pablo De Gracia; Efrain Romo-Garcia; Jesus Ortega. (2019). UV protection of contact lenses under outdoor light environments: beach, snow and city. *ARVO Annual Meeting,* Vancouver, BC.
c) **Teran, Emiliano**. (2019). Optometric education beyond borders. *Journal of Optometric Education*: Volume 44 Number 3.
d) **Teran,** E., Yee-Rendon, C. M., Ortega-Salazar, J., De Gracia, P., Garcia-Romo, E., & Woods, R. L. (2020). Evaluation of two strategies for alleviating the impact on the circadian cycle of smartphone screens. *Optometry and Vision Science*, *97*(3), 207-217.
e) **Teran, E**., Ramírez-Jaime, R., Martínez-Gaytán, C., Romo-García, E., & Costela, F. M. (2021). Refractive Error of Students (15-to 18-year-olds) in Northwest Mexico. *Optometry and Vision Science*, *98*(10), 1127-1131.

D. Research Support

<u>Completed Research Support</u>

Terán (PI)
1/01/2020 to 15/12/2025
Essilor Foundation, Vision For Life program funding
PILOT study: Effects of SETO Anti Blu-Ray lenses on visual functions and sleep states
To provide complete -including referral-eye health and vision care services for at least 5,400 students per year aged 11-18 years of age attending schools located in low income areas of Culiacan.
Role. PI

Terán (PI)
12/11/2018 to 23/03/2020
Private company (SETO lenses) funding
PILOT study: Effects of SETO Anti Blu-Ray lenses on visual functions and sleep states
This pilot study seeks to evaluate the benefit, if any, of blue light filter lenses in sleep states with unactivity trackers and quality of life through a questionnaire.
Role. PI

Terán (PI)
15/06/2019 to 12/13/2019
None funding
Comparison of the foveal pit morphological structures of a glaucoma patients group against a normal vision population
This study is trying to find morphological differences in the foveal pit of normal vision participants and glaucoma patients.
Role. PI

Terán (PI)
12/11/2018 to 23/03/2019
None funding
Tridimensional reconstruction of the fovea with a numeric algorithm to compare the eyes of a population with axial refractive errors
This study is focused in to rebuild the morphological structure of the foveal pit of patients with myopia, hyperopia and normal vision, with the purpose to compare their morphological changes.
Role. PI

Terán (CI)
23/08/2018 to 22/08/2019
Secretary of Education funding
Design of highly diffuser structures to increase the efficiency of solar cells
The aim of this project was to use the scattering-based coral strategy to remove the angular dependence of commercial solar cells.
Role. Co-Investigator

Terán (PI)
12/09/2018 to 15/12/2018
Private company (SETO lenses) funding
Absorption and transmittance of lenses with blue light protection
This project was focused in to measure the optical properties of Blue-light filtering spectacles.
Role. PI.

Terán (CI)
1/01/2018 to 08/12/2019
ARVO Foundation for Eye Research funding
Information acquisition as a biomarker to evaluate the vision impairment due to glaucoma
This project was about to evaluate the glaucoma through the Narrative description method (former Acquisition

information method).
Role. Fellow

Terán (PI)
1/01/2017 to not finished
Autonomous University of Sinaloa funding
Refractive error and visual dysfunctions of students of Sinaloa, Mexico
This study is devoted to assess the prevalence of refractive errors and visual dysfunctions in school students of Sinaloa, México.
Role. PI.