



## 2019 Annual Report

PREPARED BY:

UNCERTAINTY QUANTIFICATION FOUNDATION  
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PREPARED FOR:

UNCERTAINTY QUANTIFICATION FOUNDATION  
BOARD OF DIRECTORS

APRIL 27, 2020

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## Introduction

After two years of focus on establishing the central governance structures of the organization 2019 marked the first full deployment of Uncertainty Quantification Foundation's program services. We engaged with the community of predictive science practitioners through our Advisory Services, Education, and Research & Development programs and fostered some promising opportunities for the upcoming year.

Under our Advisory Services Program we engaged in two projects in 2019. Through our Technology Integration program we worked with a firm operating in the hybrid battery segment of the energy industry who was looking for a way to integrate machine learning and advanced optimization frameworks into their systems for evaluating hybrid energy networks. We provided services where the Uncertainty Quantification Foundation (UQF) evaluated their existing systems and technology and provided assistance in preparing to integrate *mystic* into the optimization processes. Additionally, in another energy industry engagement UQF offered Scientific Expertise through peer-review and critical feedback on a technical paper being produced by an organization using uncertainty quantification for the validation and certification of predictive models of the induction of seismic activity resulting from the stresses of natural gas extraction activities. Overall, our Advisory Services program generated \$16,790 in revenue for the Foundation.

With the support of a generous grant from one of the US Department of Energy national labs we were able to hold a public lecture series through our Education Program. Over the course of three days UQF presented lectures on "Fundamental Concepts in Data Science" that were open to the public and attracted a contingent of researchers from Los Alamos National Laboratory. We presented topics on "Foundations of Machine Learning," "Numerical Features and Regression," and "Categorical Features and Classification," all with a focus on presenting Data Science, machine learning, and supervised learning in a way that is accessible to experimental scientists and engineers. The grant for this lecture series provided \$4,320 in funding for the UQF Education Program.

We were also able to initiate some exciting work through our Research & Development program. Along with the U.S. Department of Energy, Office of Science, Office of Advanced Scientific Computing Research (specifically through the Mathematical Multifaceted Integrated Capability Centers (MMICCS) program) we supported research to demonstrate the utility of an Optimal Uncertainty Quantification (OUQ) approach to understanding the behavior of a system that is governed by a partial differential equation. The paper resulting from that research, "Optimal Bounds on Nonlinear Partial Differential Equations in Model Certification, Validation, and Experimental Design," was submitted for peer-reviewed publication and we hope to see it published in 2020. Additionally, UQF entered into a Strategic Research Partnership agreement with a genetics research company to assist them in the development of statistical modelling software with integrated adaptive learning. This project lead to a year long Cooperative Research and Development Agreement to conduct the research necessary to extend the capability of *mystic* to include the automated learning of valid emulators, with applications for gene sequencing. This CRDA is expected to run through the third quarter of 2020. All together our Research & Development Program generated \$80,888 in grant funding and revenue for UQF in 2019.

As we look forward to 2020, we have significant opportunity to continue growing our fundamental and applied research efforts, and expect that we will be able to invest some of the funding from those programs into developing more robust infrastructure to support all of our programs.

## Financial Statements

### STATEMENTS OF FINANCIAL POSITIONS

December 31, 2019

With Comparative Totals as of December 31, 2018

|                                     | 2019            | 2018           |
|-------------------------------------|-----------------|----------------|
| <b>ASSETS</b>                       |                 |                |
| <b>Current Assets</b>               |                 |                |
| Cash and cash equivalents           | \$24,379        | \$4,843        |
| Grants Receivable                   | 24,750          | -              |
| Accounts Receivable                 | 36,056          | -              |
|                                     | <hr/>           | <hr/>          |
| Total Current Assets                | 85,185          | 4,843          |
| Total Assets                        | <u>\$85,185</u> | <u>\$4,843</u> |
| <b>LIABILITIES &amp; NET ASSETS</b> |                 |                |
| <b>Liabilities</b>                  |                 |                |
| Accounts Payable                    | \$65,810        | \$-            |
| Total Liabilities                   | 65,810          | -              |
| <b>Net Assets</b>                   |                 |                |
| Without donor restrictions          | 19,375          | 4,843          |
|                                     | <hr/>           | <hr/>          |
| Total Net Assets                    | 19,375          | 4,843          |
| Total Liabilities & Net Assets      | <u>\$85,185</u> | <u>\$4,843</u> |

See notes to financial statements.

STATEMENTS OF ACTIVITIES

For the Year Ended December 31, 2019

With Comparative Totals for the Year Ended December 31, 2018

|                                       | 2019                      |                            |          | 2018    |
|---------------------------------------|---------------------------|----------------------------|----------|---------|
|                                       | W/O Donor<br>Restrictions | With Donor<br>Restrictions | Total    | Total   |
| <b>Income and Other Support</b>       |                           |                            |          |         |
| Grants                                | \$24,750                  | \$4,320                    | \$29,070 | \$-     |
| Contracts                             | 72,928                    |                            | 72,928   | 24,950  |
|                                       | 97,678                    | 4,320                      | 101,998  | 24,950  |
| Net assets released from restrictions | 4,320                     | (4,320)                    | -        | -       |
| Total Income and Other Support        | 101,998                   | -                          | 101,998  | 24,950  |
| <b>Expenses</b>                       |                           |                            |          |         |
| Program Services                      |                           |                            |          |         |
| Research & Development                | 70,103                    |                            | 70,103   | -       |
| Education Program                     | -                         |                            | -        | 18,271  |
| Advisory Services                     | 14,642                    |                            | 14,642   | -       |
| Total Program Services                | 84,745                    | -                          | 84,745   | 18,271  |
| Supporting Services                   |                           |                            |          |         |
| Management and general                | 2,721                     |                            | 2,721    | 1,202   |
| Total Supporting Services             | 2,721                     | -                          | 2,721    | 1,202   |
| Total Expenses                        | 87,465                    | -                          | 87,465   | 19,474  |
| Change in Net Assets                  | 14,533                    | -                          | 14,533   | 5,476   |
| <b>Net Assets</b>                     |                           |                            |          |         |
| Beginning of Year                     | 4,843                     | -                          | 4,843    | (634)   |
| End of Year                           | \$19,375                  | \$-                        | \$19,375 | \$4,843 |

See notes to financial statements.

## STATEMENTS OF FUNCTIONAL EXPENSES

For the Year Ended December 31, 2019

With Comparative Totals for the Year Ended December 31, 2018

|                                 | Program Services       |           |                   | Supporting Services  | 2019<br>Total | 2018<br>Total |
|---------------------------------|------------------------|-----------|-------------------|----------------------|---------------|---------------|
|                                 | Research & Development | Education | Advisory Services | Management & General |               |               |
| Compensation-Officers/Directors | \$ 70,103              |           | \$ 2,864          | \$ 1,536             | \$ 74,503     | \$ 16,650     |
| Payroll Taxes                   |                        |           | 46                | 183                  | 228           |               |
| Fees for Services               |                        |           | 11,702            | 523                  | 12,225        | 58            |
| Office Expenses                 |                        |           | 126               | 396                  | 522           | 2,516         |
| Information Technology          |                        |           |                   | 58                   | 58            | 59            |
| All Other Expenses              |                        |           | (95)              | 25                   | (70)          | 190           |
| Total Expenses                  | \$ 70,103              | \$ -      | \$ 14,642         | \$ 2,721             | \$ 87,465     | \$ 19,474     |

## STATEMENTS OF CASH FLOWS

For the Year Ended December 31, 2019

With Comparative Totals for the Year Ended December 31, 2018

|   | 2019      | 2018     |
|---|-----------|----------|
| <b>Cash Flow From Operating Activities</b>  |           |          |
| Change in net assets  | \$ 14,533 | \$ 5,477 |
| Adjustments to reconcile change in net assets to net cash provided (used) by operating activities |           |          |
| Changes in operating assets and liabilities   |           |          |
| Contributions receivable  | (24,750)  | -        |
| Loans/notes receivable  | -         | (2,364)  |
| Accounts receivable   | (36,056)  | -        |
| Accounts payable  | 65,810    | -        |
| Net Cash Provided (Used) by Operating Activities  | 19,536    | 3,112    |
| <b>Cash Flow From Investing Activities</b>  |           |          |
| Net Cash Provided (Used) by Investing Activities  | -         | -        |
| Net Change in Cash and Cash Equivalents   | 19,536    | 3,112    |
| <b>Cash and Cash Equivalents - Beginning of Year</b>  | 4,843     | 1,730    |
| <b>Cash and Cash Equivalents - End of Year</b>  | \$ 24,379 | \$ 4,843 |

See notes to financial statements.

## NOTES TO FINANCIAL STATEMENTS

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### Note A - Summary of Significant Accounting Policies

#### *Nature of Organization*

Uncertainty Quantification Foundation (the Foundation) is a nonprofit corporation registered in Delaware, and operating in Illinois. The objective of the Foundation, to advance the field of predictive science, is accomplished through scientific research of uncertainty quantification tools, technologies and methodologies and conducting education programs in predictive science and uncertainty quantification.

#### *Basis of Accounting*

The accompanying financial statements have been prepared on the accrual basis of accounting in accordance with accounting principles generally accepted in the United States of America.

#### *Basis of Presentation*

The Foundation reports net assets and revenues, expenses, gains and losses are classified according to two classes of net assets: with donor restrictions and without donor restrictions. Net assets without donor restrictions are available for use at the discretion of the Board of Directors and/or management for general operating purposes. Net assets with donor restrictions consist of assets whose use is limited by donor-imposed, time and/or purpose restrictions.

#### *Use of Estimates*

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of income and expenses during the reporting period. Actual results could differ from those estimates.

#### *Cash and Cash Equivalents*

Cash includes cash on hand as well as checking accounts with financial institutions. The Foundation considers all short-term investments purchased with maturity of three months or less to be cash equivalents.

#### *Contributions, Grants, and Donor Imposed Restrictions*

Contributions are considered to be available for unrestricted use unless specifically restricted by the donor. Amounts received that are restricted by the donor for specific purposes are reported as contributions with donor restrictions that increase that net asset class. When donor restrictions expire, that is, when a time restriction ends and/or a purpose restriction is fulfilled, net assets with donor restrictions are reclassified to net assets without donor restrictions and reported in the statement of activities as net assets released from restriction.

## Note A - Summary of Significant Accounting Policies (*Continued*)

### *Functional Allocation of Expenses*

The costs of providing the various programs and other activities have been summarized on a functional basis in the statement of activities and in the statement of functional expenses. Certain categories of expenses are attributable to more than one program or supporting function and are allocated on a reasonable basis that is consistently applied. The expenses that are allocated are employee salaries (including any compensation to officers/Directors), employee benefits, and payroll taxes, which are allocated on the basis of estimates of time and effort. Management has allocated other office costs to only the management and general function as the management and general expenses include those expenses that are not directly identifiable with any other specific function but provide for the overall support and direction of the Foundation.

### *Income Taxes*

The Foundation is a nonprofit organization that has applied for exemption from income taxes under Section 501(c)(3) of the Internal Revenue Code and comparable state law. Accordingly, no provision for income taxes is made in the financial statements.

### *Comparative Data*

The amounts shown for the year ended December 31, 2018 in the accompanying financial statements are included to provide a basis for comparison with 2019 and present summarized totals only. Accordingly, the 2018 totals are not intended to present all information necessary for a fair presentation in conformity with accounting principles generally accepted in the United States of America. Such information should be read in conjunction with the Foundation's financial statements for the year ended December 31, 2018 from which the summarized information was derived.

## Note B - Liquidity and Availability of Resources

The Foundation's financial assets available within one year of the statement of financial position date for general expenditures are as follows:

|   |                      |
|---|----------------------|
| Cash and Cash Equivalents   | \$ 24,379            |
| Contributions Receivable  | 24,750               |
| Contracts Receivable  | <u>36,056</u>        |
| <br>Total financial assets available within one year                          | <br>85,185           |
| <br>Less amounts unavailable for general expenditures within one year due to: |                      |
| Restricted by donors with purpose restriction                                 | -                    |
| Restricted by donors with time restriction                                    | <u>-</u>             |
| <br>Total amount unavailable for general expenditures within one year         | <br><u>-</u>         |
| <br>Total financial assets available within one year after restriction        | <br><u>\$ 85,185</u> |

As part of the Foundation's liquidity management, it has a policy to structure its financial assets to be available as its general expenditures, liabilities, and other obligations come due. At December 31, 2019, all net assets are available for payment of any major expenditures incurred, except for contributions and contracts receivable which are available when the receivable is collected which is expected within one year of the statement of financial position date.

## Statements of Transactions with Interested Persons

As part of the annual report to all Directors the Uncertainty Quantification Foundation annually prepares and furnishes to each director a statement of any transaction or indemnification of the following kind:

1. Any transaction to which the Foundation was a party, in which an "interested person" had a direct or indirect material financial interest, and which involved more than \$50,000 or was one of several transactions with the same interested person involving, in the aggregate, more than \$50,000. For these purposes, an "interested person" is either: (a) any director or officer of the Foundation; or (b) any holder of more than 10% of the voting power of the corporation.
2. Any indemnification or advances aggregating more than \$10,000 paid during the fiscal year to any officer or director of the Foundation.

### STATEMENTS OF TRANSACTIONS WITH INTERESTED PERSONS

For the Year Ended December 31, 2019

| <u>Description of Transaction</u>    | <u>Name of Interested Person</u> | <u>Relationship to the Foundation</u> | <u>Nature of Interest</u> | <u>Amount</u> |
|--------------------------------------|----------------------------------|---------------------------------------|---------------------------|---------------|
| Research under Independent Contracts | McKerns, Michael                 | Director and officer                  | Contract recipient        | \$ 72,967     |

## Certification

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal controls relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

The accompanying financial statements of Uncertainty Quantification Foundation (a nonprofit organization), which comprise the statement of financial position as of December 31, 2019 and the related statements of activities, functional expenses, and cash flows for the year then ended, and the related notes to the financial statements have been prepared and furnished without an audit from the books and records of the Foundation by an independent accountant.

*Evan McKerns*  
 Certified By

Executive Director  
 Title