

Form 5500 Department of the Treasury Internal Revenue Service Department of Labor Employee Benefits Security Administration Pension Benefit Guaranty Corporation	Annual Return/Report of Employee Benefit Plan This form is required to be filed for employee benefit plans under sections 104 and 4065 of the Employee Retirement Income Security Act of 1974 (ERISA) and sections 6057(b) and 6058(a) of the Internal Revenue Code (the Code). ▶ Complete all entries in accordance with the instructions to the Form 5500.	OMB Nos. 1210-0110 1210-0089 2022 This Form is Open to Public Inspection
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Part I	Annual Report Identification Information
For calendar plan year 2022 or fiscal plan year beginning 01/01/2022 and ending 12/31/2022	
A This return/report is for:	☐ a multiemployer plan ☐ a multiple-employer plan (Filers checking this box must attach a list of participating employer information in accordance with the form instructions.) ☒ a single-employer plan ☐ a DFE (specify) _____
B This return/report is:	☐ the first return/report ☐ the final return/report ☐ an amended return/report ☐ a short plan year return/report (less than 12 months)
C If the plan is a collectively-bargained plan, check here.	▶ ☐
D Check box if filing under:	☐ Form 5558 ☐ automatic extension ☐ the DFVC program ☐ special extension (enter description)
E If this is a retroactively adopted plan permitted by SECURE Act section 201, check here.	▶ ☐

Part II	Basic Plan Information —enter all requested information
1a Name of plan W. M. KECK OBSERVATORY 403(B) RETIREMENT PLAN	1b Three-digit plan number (PN) ▶ 001
	1c Effective date of plan 07/22/1985
2a Plan sponsor's name (employer, if for a single-employer plan) Mailing address (include room, apt., suite no. and street, or P.O. Box) City or town, state or province, country, and ZIP or foreign postal code (if foreign, see instructions) CALIFORNIA ASSOCIATION FOR RESEARCH IN ASTRONOMY DBA W. M. KECK OBSERVATORY 65-1120 MAMALAHOA HWY KAMUELA, HI 96743-8431	2b Employer Identification Number (EIN) 95-3972799 2c Plan Sponsor's telephone number 808-885-7887 2d Business code (see instructions) 611000

Caution: A penalty for the late or incomplete filing of this return/report will be assessed unless reasonable cause is established.

Under penalties of perjury and other penalties set forth in the instructions, I declare that I have examined this return/report, including accompanying schedules, statements and attachments, as well as the electronic version of this return/report, and to the best of my knowledge and belief, it is true, correct, and complete.

SIGN HERE	Filed with authorized/valid electronic signature.	06/22/2023	GRETCHEN MAGNUSON
	Signature of plan administrator	Date	Enter name of individual signing as plan administrator
SIGN HERE			
	Signature of employer/plan sponsor	Date	Enter name of individual signing as employer or plan sponsor
SIGN HERE			
	Signature of DFE	Date	Enter name of individual signing as DFE

For Paperwork Reduction Act Notice, see the Instructions for Form 5500.

Form 5500 (2022)
v. 220413

3a Plan administrator's name and address ☒ Same as Plan Sponsor		3b Administrator's EIN
		3c Administrator's telephone number
4 If the name and/or EIN of the plan sponsor or the plan name has changed since the last return/report filed for this plan, enter the plan sponsor's name, EIN, the plan name and the plan number from the last return/report: a Sponsor's name c Plan Name		4b EIN 4d PN
5 Total number of participants at the beginning of the plan year		5 291
6 Number of participants as of the end of the plan year unless otherwise stated (welfare plans complete only lines 6a(1) , 6a(2) , 6b , 6c , and 6d).		
a(1) Total number of active participants at the beginning of the plan year		6a(1) 120
a(2) Total number of active participants at the end of the plan year		6a(2) 146
b Retired or separated participants receiving benefits		6b 0
c Other retired or separated participants entitled to future benefits.....		6c 166
d Subtotal. Add lines 6a(2) , 6b , and 6c		6d 312
e Deceased participants whose beneficiaries are receiving or are entitled to receive benefits.		6e 4
f Total. Add lines 6d and 6e		6f 316
g Number of participants with account balances as of the end of the plan year (only defined contribution plans complete this item).....		6g 310
h Number of participants who terminated employment during the plan year with accrued benefits that were less than 100% vested.....		6h 0
7 Enter the total number of employers obligated to contribute to the plan (only multiemployer plans complete this item)		7
8a If the plan provides pension benefits, enter the applicable pension feature codes from the List of Plan Characteristics Codes in the instructions: 2L 2M 3D 2G 2F		
b If the plan provides welfare benefits, enter the applicable welfare feature codes from the List of Plan Characteristics Codes in the instructions:		
9a Plan funding arrangement (check all that apply)		9b Plan benefit arrangement (check all that apply)
(1) ☒ Insurance	(1) ☒ Insurance	
(2) ☐ Code section 412(e)(3) insurance contracts	(2) ☐ Code section 412(e)(3) insurance contracts	
(3) ☒ Trust	(3) ☒ Trust	
(4) ☐ General assets of the sponsor	(4) ☐ General assets of the sponsor	
10 Check all applicable boxes in 10a and 10b to indicate which schedules are attached, and, where indicated, enter the number attached. (See instructions)		
a Pension Schedules		b General Schedules
(1) ☒ R (Retirement Plan Information)	(1) ☒ H (Financial Information)	
(2) ☐ MB (Multiemployer Defined Benefit Plan and Certain Money Purchase Plan Actuarial Information) - signed by the plan actuary	(2) ☐ I (Financial Information – Small Plan)	
(3) ☐ SB (Single-Employer Defined Benefit Plan Actuarial Information) - signed by the plan actuary	(3) ☒ 1 A (Insurance Information)	
	(4) ☒ C (Service Provider Information)	
	(5) ☒ D (DFE/Participating Plan Information)	
	(6) ☐ G (Financial Transaction Schedules)	

Part III Form M-1 Compliance Information (to be completed by welfare benefit plans)

11a If the plan provides welfare benefits, was the plan subject to the Form M-1 filing requirements during the plan year? (See instructions and 29 CFR 2520.101-2.) ☐ Yes ☐ No

If "Yes" is checked, complete lines 11b and 11c.

11b Is the plan currently in compliance with the Form M-1 filing requirements? (See instructions and 29 CFR 2520.101-2.) ☐ Yes ☐ No

11c Enter the Receipt Confirmation Code for the 2022 Form M-1 annual report. If the plan was not required to file the 2022 Form M-1 annual report, enter the Receipt Confirmation Code for the most recent Form M-1 that was required to be filed under the Form M-1 filing requirements. (Failure to enter a valid Receipt Confirmation Code will subject the Form 5500 filing to rejection as incomplete.)

Receipt Confirmation Code _____

SCHEDULE A (Form 5500) Department of the Treasury Internal Revenue Service Department of Labor Employee Benefits Security Administration Pension Benefit Guaranty Corporation	Insurance Information This schedule is required to be filed under section 104 of the Employee Retirement Income Security Act of 1974 (ERISA). ▶ File as an attachment to Form 5500. ▶ Insurance companies are required to provide the information pursuant to ERISA section 103(a)(2).	OMB No. 1210-0110 2022 This Form is Open to Public Inspection
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For calendar plan year 2022 or fiscal plan year beginning 01/01/2022 and ending 12/31/2022		
A Name of plan W. M. KECK OBSERVATORY 403(B) RETIREMENT PLAN	B Three-digit plan number (PN) ▶	001
C Plan sponsor's name as shown on line 2a of Form 5500 CALIFORNIA ASSOCIATION FOR RESEARCH IN ASTRONOMY	D Employer Identification Number (EIN) 95-3972799	

Part I	Information Concerning Insurance Contract Coverage, Fees, and Commissions	Provide information for each contract on a separate Schedule A. Individual contracts grouped as a unit in Parts II and III can be reported on a single Schedule A.
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1 Coverage Information:

(a) Name of insurance carrier TIAA-CREF
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(b) EIN	(c) NAIC code	(d) Contract or identification number	(e) Approximate number of persons covered at end of policy or contract year	Policy or contract year	
				(f) From	(g) To
13-1624203	69345	500881	218	01/01/2022	12/31/2022

2 Insurance fee and commission information. Enter the total fees and total commissions paid. List in line 3 the agents, brokers, and other persons in descending order of the amount paid.

(a) Total amount of commissions paid	(b) Total amount of fees paid

3 Persons receiving commissions and fees. (Complete as many entries as needed to report all persons).

(a) Name and address of the agent, broker, or other person to whom commissions or fees were paid
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(b) Amount of sales and base commissions paid	Fees and other commissions paid		(e) Organization code
	(c) Amount	(d) Purpose	

(a) Name and address of the agent, broker, or other person to whom commissions or fees were paid
--

(b) Amount of sales and base commissions paid	Fees and other commissions paid		(e) Organization code
	(c) Amount	(d) Purpose	

(a) Name and address of the agent, broker, or other person to whom commissions or fees were paid

(b) Amount of sales and base commissions paid	Fees and other commissions paid		(e) Organization code
	(c) Amount	(d) Purpose	

(a) Name and address of the agent, broker, or other person to whom commissions or fees were paid

(b) Amount of sales and base commissions paid	Fees and other commissions paid		(e) Organization code
	(c) Amount	(d) Purpose	

(a) Name and address of the agent, broker, or other person to whom commissions or fees were paid

(b) Amount of sales and base commissions paid	Fees and other commissions paid		(e) Organization code
	(c) Amount	(d) Purpose	

(a) Name and address of the agent, broker, or other person to whom commissions or fees were paid

(b) Amount of sales and base commissions paid	Fees and other commissions paid		(e) Organization code
	(c) Amount	(d) Purpose	

(a) Name and address of the agent, broker, or other person to whom commissions or fees were paid

(b) Amount of sales and base commissions paid	Fees and other commissions paid		(e) Organization code
	(c) Amount	(d) Purpose	

Part II Investment and Annuity Contract Information

Where individual contracts are provided, the entire group of such individual contracts with each carrier may be treated as a unit for purposes of this report.

4	Current value of plan's interest under this contract in the general account at year end.....	4	9965378
5	Current value of plan's interest under this contract in separate accounts at year end.....	5	28513140

6 Contracts With Allocated Funds:**a** State the basis of premium rates ▶

b	Premiums paid to carrier	6b	
c	Premiums due but unpaid at the end of the year	6c	
d	If the carrier, service, or other organization incurred any specific costs in connection with the acquisition or retention of the contract or policy, enter amount..... Specify nature of costs ▶	6d	

e Type of contract: (1) ☐ individual policies (2) ☐ group deferred annuity
(3) ☐ other (specify) ▶

f If contract purchased, in whole or in part, to distribute benefits from a terminating plan, check here ▶ ☐**7 Contracts With Unallocated Funds (Do not include portions of these contracts maintained in separate accounts)**

a Type of contract: (1) ☐ deposit administration (2) ☐ immediate participation guarantee
(3) ☒ guaranteed investment (4) ☐ other ▶

b	Balance at the end of the previous year	7b	9638147
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c	Additions: (1) Contributions deposited during the year	7c(1)	191836	
	(2) Dividends and credits	7c(2)		
	(3) Interest credited during the year	7c(3)	385700	
	(4) Transferred from separate account	7c(4)	325027	
	(5) Other (specify below)	7c(5)	2861	

▶ PARTICIPANT LOAN INTEREST, PARTICIPANT LOAN PRINCIPAL REPAYMENT

(6) Total additions	7c(6)	905424
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d	Total of balance and additions (add lines 7b and 7c(6))	7d	10543571
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e Deductions:

(1) Disbursed from fund to pay benefits or purchase annuities during year	7e(1)	310336	
(2) Administration charge made by carrier	7e(2)		
(3) Transferred to separate account	7e(3)	203212	
(4) Other (specify below)	7e(4)	64645	

▶ PLAN FEES, PLAN SERVICING CREDIT

(5) Total deductions	7e(5)	578193
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f	Balance at the end of the current year (subtract line 7e(5) from line 7d)	7f	9965378
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Part III Welfare Benefit Contract Information

If more than one contract covers the same group of employees of the same employer(s) or members of the same employee organizations(s), the information may be combined for reporting purposes if such contracts are experience-rated as a unit. Where contracts cover individual employees, the entire group of such individual contracts with each carrier may be treated as a unit for purposes of this report.

8 Benefit and contract type (check all applicable boxes)

- a** ☐ Health (other than dental or vision)
 b ☐ Dental
 c ☐ Vision
 d ☐ Life insurance
e ☐ Temporary disability (accident and sickness)
 f ☐ Long-term disability
 g ☐ Supplemental unemployment
 h ☐ Prescription drug
i ☐ Stop loss (large deductible)
 j ☐ HMO contract
 k ☐ PPO contract
 l ☐ Indemnity contract
m ☐ Other (specify) ▶

9 Experience-rated contracts:

a Premiums: (1) Amount received	9a(1)		
(2) Increase (decrease) in amount due but unpaid	9a(2)		
(3) Increase (decrease) in unearned premium reserve	9a(3)		
(4) Earned ((1) + (2) - (3))		9a(4)	0
b Benefit charges (1) Claims paid	9b(1)		
(2) Increase (decrease) in claim reserves	9b(2)		
(3) Incurred claims (add (1) and (2))		9b(3)	0
(4) Claims charged		9b(4)	
c Remainder of premium: (1) Retention charges (on an accrual basis) --			
(A) Commissions	9c(1)(A)		
(B) Administrative service or other fees	9c(1)(B)		
(C) Other specific acquisition costs	9c(1)(C)		
(D) Other expenses	9c(1)(D)		
(E) Taxes	9c(1)(E)		
(F) Charges for risks or other contingencies	9c(1)(F)		
(G) Other retention charges	9c(1)(G)		
(H) Total retention		9c(1)(H)	0
(2) Dividends or retroactive rate refunds. (These amounts were ☐ paid in cash, or ☐ credited.)		9c(2)	
d Status of policyholder reserves at end of year: (1) Amount held to provide benefits after retirement		9d(1)	
(2) Claim reserves		9d(2)	
(3) Other reserves		9d(3)	
e Dividends or retroactive rate refunds due. (Do not include amount entered in line 9c(2).)		9e	

10 Nonexperience-rated contracts:

a Total premiums or subscription charges paid to carrier	10a	
b If the carrier, service, or other organization incurred any specific costs in connection with the acquisition or retention of the contract or policy, other than reported in Part I, line 2 above, report amount. Specify nature of costs.	10b	

Part IV Provision of Information

11 Did the insurance company fail to provide any information necessary to complete Schedule A? ☐ Yes ☒ No

12 If the answer to line 11 is "Yes," specify the information not provided. ▶

SCHEDULE C (Form 5500) Department of the Treasury Internal Revenue Service Department of Labor Employee Benefits Security Administration Pension Benefit Guaranty Corporation	Service Provider Information This schedule is required to be filed under section 104 of the Employee Retirement Income Security Act of 1974 (ERISA). ▶ File as an attachment to Form 5500.	OMB No. 1210-0110
		2022
		This Form is Open to Public Inspection.

For calendar plan year 2022 or fiscal plan year beginning 01/01/2022 and ending 12/31/2022		
A Name of plan W. M. KECK OBSERVATORY 403(B) RETIREMENT PLAN	B Three-digit plan number (PN) ▶	001
C Plan sponsor's name as shown on line 2a of Form 5500 CALIFORNIA ASSOCIATION FOR RESEARCH IN ASTRONOMY	D Employer Identification Number (EIN) 95-3972799	

Part I	Service Provider Information (see instructions)
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You must complete this Part, in accordance with the instructions, to report the information required for **each person** who received, directly or indirectly, \$5,000 or more in total compensation (i.e., money or anything else of monetary value) in connection with services rendered to the plan or the person's position with the plan during the plan year. If a person received **only** eligible indirect compensation for which the plan received the required disclosures, you are required to answer line 1 but are not required to include that person when completing the remainder of this Part.

1 Information on Persons Receiving Only Eligible Indirect Compensation

- a Check "Yes" or "No" to indicate whether you are excluding a person from the remainder of this Part because they received only eligible indirect compensation for which the plan received the required disclosures (see instructions for definitions and conditions)..... ☒ Yes ☐ No
- b If you answered line 1a "Yes," enter the name and EIN or address of each person providing the required disclosures for the service providers who received only eligible indirect compensation. Complete as many entries as needed (see instructions).

(b) Enter name and EIN or address of person who provided you disclosures on eligible indirect compensation
TIAA
13-1624203

(b) Enter name and EIN or address of person who provided you disclosures on eligible indirect compensation
--

(b) Enter name and EIN or address of person who provided you disclosures on eligible indirect compensation
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(b) Enter name and EIN or address of person who provided you disclosures on eligible indirect compensation

2. Information on Other Service Providers Receiving Direct or Indirect Compensation. Except for those persons for whom you answered "Yes" to line 1a above, complete as many entries as needed to list each person receiving, directly or indirectly, \$5,000 or more in total compensation (i.e., money or anything else of value) in connection with services rendered to the plan or their position with the plan during the plan year. (See instructions).

(a) Enter name and EIN or address (see instructions)

TIAA

730 THIRD AVE
NEW YORK, NY 10017-3206

13-1624203

(b) Service Code(s)	(c) Relationship to employer, employee organization, or person known to be a party-in-interest	(d) Enter direct compensation paid by the plan. If none, enter -0-.	(e) Did service provider receive indirect compensation? (sources other than plan or plan sponsor)	(f) Did indirect compensation include eligible indirect compensation, for which the plan received the required disclosures?	(g) Enter total indirect compensation received by service provider excluding eligible indirect compensation for which you answered "Yes" to element (f). If none, enter -0-.	(h) Did the service provider give you a formula instead of an amount or estimated amount?
64 65	RECORDKEEPER	54838	Yes ☒ No ☐	Yes ☒ No ☐	0	Yes ☐ No ☒

(a) Enter name and EIN or address (see instructions)

KKDLY LLC

745 FORT STREET MALL
STE 2100
HONOLULU, HI 96813-3819

99-0292355

(b) Service Code(s)	(c) Relationship to employer, employee organization, or person known to be a party-in-interest	(d) Enter direct compensation paid by the plan. If none, enter -0-.	(e) Did service provider receive indirect compensation? (sources other than plan or plan sponsor)	(f) Did indirect compensation include eligible indirect compensation, for which the plan received the required disclosures?	(g) Enter total indirect compensation received by service provider excluding eligible indirect compensation for which you answered "Yes" to element (f). If none, enter -0-.	(h) Did the service provider give you a formula instead of an amount or estimated amount?
10	AUDITOR	28377	Yes ☐ No ☒	Yes ☐ No ☐		Yes ☐ No ☐

(a) Enter name and EIN or address (see instructions)

ALPHAPOINT, INC.

2101 E. COAST HWY., SUITE 120
CORONA DEL MAR, CA 92625-1970

14-1884337

(b) Service Code(s)	(c) Relationship to employer, employee organization, or person known to be a party-in-interest	(d) Enter direct compensation paid by the plan. If none, enter -0-.	(e) Did service provider receive indirect compensation? (sources other than plan or plan sponsor)	(f) Did indirect compensation include eligible indirect compensation, for which the plan received the required disclosures?	(g) Enter total indirect compensation received by service provider excluding eligible indirect compensation for which you answered "Yes" to element (f). If none, enter -0-.	(h) Did the service provider give you a formula instead of an amount or estimated amount?
49	NONE	7000	Yes ☐ No ☒	Yes ☐ No ☐		Yes ☐ No ☐

Part I Service Provider Information (continued)

3. If you reported on line 2 receipt of indirect compensation, other than eligible indirect compensation, by a service provider, and the service provider is a fiduciary or provides contract administrator, consulting, custodial, investment advisory, investment management, broker, or recordkeeping services, answer the following questions for (a) each source from whom the service provider received \$1,000 or more in indirect compensation and (b) each source for whom the service provider gave you a formula used to determine the indirect compensation instead of an amount or estimated amount of the indirect compensation. Complete as many entries as needed to report the required information for each source.

(a) Enter service provider name as it appears on line 2	(b) Service Codes (see instructions)	(c) Enter amount of indirect compensation
(d) Enter name and EIN (address) of source of indirect compensation	(e) Describe the indirect compensation, including any formula used to determine the service provider's eligibility for or the amount of the indirect compensation.	
(a) Enter service provider name as it appears on line 2	(b) Service Codes (see instructions)	(c) Enter amount of indirect compensation
(d) Enter name and EIN (address) of source of indirect compensation	(e) Describe the indirect compensation, including any formula used to determine the service provider's eligibility for or the amount of the indirect compensation.	
(a) Enter service provider name as it appears on line 2	(b) Service Codes (see instructions)	(c) Enter amount of indirect compensation
(d) Enter name and EIN (address) of source of indirect compensation	(e) Describe the indirect compensation, including any formula used to determine the service provider's eligibility for or the amount of the indirect compensation.	

Part II Service Providers Who Fail or Refuse to Provide Information

4 Provide, to the extent possible, the following information for each service provider who failed or refused to provide the information necessary to complete this Schedule.

(a) Enter name and EIN or address of service provider (see instructions)	(b) Nature of Service Code(s)	(c) Describe the information that the service provider failed or refused to provide
(a) Enter name and EIN or address of service provider (see instructions)	(b) Nature of Service Code(s)	(c) Describe the information that the service provider failed or refused to provide
(a) Enter name and EIN or address of service provider (see instructions)	(b) Nature of Service Code(s)	(c) Describe the information that the service provider failed or refused to provide
(a) Enter name and EIN or address of service provider (see instructions)	(b) Nature of Service Code(s)	(c) Describe the information that the service provider failed or refused to provide
(a) Enter name and EIN or address of service provider (see instructions)	(b) Nature of Service Code(s)	(c) Describe the information that the service provider failed or refused to provide
(a) Enter name and EIN or address of service provider (see instructions)	(b) Nature of Service Code(s)	(c) Describe the information that the service provider failed or refused to provide

Part III Termination Information on Accountants and Enrolled Actuaries (see instructions)
(complete as many entries as needed)

a Name:	b EIN:
c Position:	
d Address:	e Telephone:

Explanation:

a Name:	b EIN:
c Position:	
d Address:	e Telephone:

Explanation:

a Name:	b EIN:
c Position:	
d Address:	e Telephone:

Explanation:

a Name:	b EIN:
c Position:	
d Address:	e Telephone:

Explanation:

a Name:	b EIN:
c Position:	
d Address:	e Telephone:

Explanation:

SCHEDULE D (Form 5500) Department of the Treasury Internal Revenue Service Department of Labor Employee Benefits Security Administration	DFE/Participating Plan Information This schedule is required to be filed under section 104 of the Employee Retirement Income Security Act of 1974 (ERISA). ► File as an attachment to Form 5500.	OMB No. 1210-0110 2022 This Form is Open to Public Inspection.
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For calendar plan year 2022 or fiscal plan year beginning 01/01/2022 and ending 12/31/2022		
A Name of plan W. M. KECK OBSERVATORY 403(B) RETIREMENT PLAN	B Three-digit plan number (PN) ►	001
C Plan or DFE sponsor's name as shown on line 2a of Form 5500 CALIFORNIA ASSOCIATION FOR RESEARCH IN ASTRONOMY	D Employer Identification Number (EIN) 95-3972799	

Part I	Information on interests in MTIAs, CCTs, PSAs, and 103-12 IEs (to be completed by plans and DFEs) (Complete as many entries as needed to report all interests in DFEs)
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a Name of MTIA, CCT, PSA, or 103-12 IE: TIAA REAL ESTATE		
b Name of sponsor of entity listed in (a): TIAA-CREF		
c EIN-PN 13-1624203-004	d Entity code P	e Dollar value of interest in MTIA, CCT, PSA, or 103-12 IE at end of year (see instructions) 2385972
a Name of MTIA, CCT, PSA, or 103-12 IE:		
b Name of sponsor of entity listed in (a):		
c EIN-PN	d Entity code	e Dollar value of interest in MTIA, CCT, PSA, or 103-12 IE at end of year (see instructions)
a Name of MTIA, CCT, PSA, or 103-12 IE:		
b Name of sponsor of entity listed in (a):		
c EIN-PN	d Entity code	e Dollar value of interest in MTIA, CCT, PSA, or 103-12 IE at end of year (see instructions)
a Name of MTIA, CCT, PSA, or 103-12 IE:		
b Name of sponsor of entity listed in (a):		
c EIN-PN	d Entity code	e Dollar value of interest in MTIA, CCT, PSA, or 103-12 IE at end of year (see instructions)
a Name of MTIA, CCT, PSA, or 103-12 IE:		
b Name of sponsor of entity listed in (a):		
c EIN-PN	d Entity code	e Dollar value of interest in MTIA, CCT, PSA, or 103-12 IE at end of year (see instructions)
a Name of MTIA, CCT, PSA, or 103-12 IE:		
b Name of sponsor of entity listed in (a):		
c EIN-PN	d Entity code	e Dollar value of interest in MTIA, CCT, PSA, or 103-12 IE at end of year (see instructions)
a Name of MTIA, CCT, PSA, or 103-12 IE:		
b Name of sponsor of entity listed in (a):		
c EIN-PN	d Entity code	e Dollar value of interest in MTIA, CCT, PSA, or 103-12 IE at end of year (see instructions)
a Name of MTIA, CCT, PSA, or 103-12 IE:		
b Name of sponsor of entity listed in (a):		
c EIN-PN	d Entity code	e Dollar value of interest in MTIA, CCT, PSA, or 103-12 IE at end of year (see instructions)

a Name of MTIA, CCT, PSA, or 103-12 IE:**b** Name of sponsor of entity listed in (a):**c** EIN-PN**d** Entity
code**e** Dollar value of interest in MTIA, CCT, PSA, or
103-12 IE at end of year (see instructions)**a** Name of MTIA, CCT, PSA, or 103-12 IE:**b** Name of sponsor of entity listed in (a):**c** EIN-PN**d** Entity
code**e** Dollar value of interest in MTIA, CCT, PSA, or
103-12 IE at end of year (see instructions)**a** Name of MTIA, CCT, PSA, or 103-12 IE:**b** Name of sponsor of entity listed in (a):**c** EIN-PN**d** Entity
code**e** Dollar value of interest in MTIA, CCT, PSA, or
103-12 IE at end of year (see instructions)**a** Name of MTIA, CCT, PSA, or 103-12 IE:**b** Name of sponsor of entity listed in (a):**c** EIN-PN**d** Entity
code**e** Dollar value of interest in MTIA, CCT, PSA, or
103-12 IE at end of year (see instructions)**a** Name of MTIA, CCT, PSA, or 103-12 IE:**b** Name of sponsor of entity listed in (a):**c** EIN-PN**d** Entity
code**e** Dollar value of interest in MTIA, CCT, PSA, or
103-12 IE at end of year (see instructions)**a** Name of MTIA, CCT, PSA, or 103-12 IE:**b** Name of sponsor of entity listed in (a):**c** EIN-PN**d** Entity
code**e** Dollar value of interest in MTIA, CCT, PSA, or
103-12 IE at end of year (see instructions)**a** Name of MTIA, CCT, PSA, or 103-12 IE:**b** Name of sponsor of entity listed in (a):**c** EIN-PN**d** Entity
code**e** Dollar value of interest in MTIA, CCT, PSA, or
103-12 IE at end of year (see instructions)**a** Name of MTIA, CCT, PSA, or 103-12 IE:**b** Name of sponsor of entity listed in (a):**c** EIN-PN**d** Entity
code**e** Dollar value of interest in MTIA, CCT, PSA, or
103-12 IE at end of year (see instructions)**a** Name of MTIA, CCT, PSA, or 103-12 IE:**b** Name of sponsor of entity listed in (a):**c** EIN-PN**d** Entity
code**e** Dollar value of interest in MTIA, CCT, PSA, or
103-12 IE at end of year (see instructions)**a** Name of MTIA, CCT, PSA, or 103-12 IE:**b** Name of sponsor of entity listed in (a):**c** EIN-PN**d** Entity
code**e** Dollar value of interest in MTIA, CCT, PSA, or
103-12 IE at end of year (see instructions)

Part II **Information on Participating Plans (to be completed by DFEs)**

(Complete as many entries as needed to report all participating plans)

a Plan name**b** Name of
plan sponsor**c** EIN-PN**a** Plan name**b** Name of
plan sponsor**c** EIN-PN**a** Plan name**b** Name of
plan sponsor**c** EIN-PN**a** Plan name**b** Name of
plan sponsor**c** EIN-PN**a** Plan name**b** Name of
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plan sponsor**c** EIN-PN**a** Plan name**b** Name of
plan sponsor**c** EIN-PN**a** Plan name**b** Name of
plan sponsor**c** EIN-PN**a** Plan name**b** Name of
plan sponsor**c** EIN-PN

SCHEDULE H (Form 5500) Department of the Treasury Internal Revenue Service Department of Labor Employee Benefits Security Administration Pension Benefit Guaranty Corporation	Financial Information This schedule is required to be filed under section 104 of the Employee Retirement Income Security Act of 1974 (ERISA), and section 6058(a) of the Internal Revenue Code (the Code). ► File as an attachment to Form 5500.	OMB No. 1210-0110 2022 This Form is Open to Public Inspection
For calendar plan year 2022 or fiscal plan year beginning <u>01/01/2022</u> and ending <u>12/31/2022</u>		
A Name of plan <u>W. M. KECK OBSERVATORY 403(B) RETIREMENT PLAN</u>	B Three-digit plan number (PN) ►	<u>001</u>
C Plan sponsor's name as shown on line 2a of Form 5500 <u>CALIFORNIA ASSOCIATION FOR RESEARCH IN ASTRONOMY</u>	D Employer Identification Number (EIN) <u>95-3972799</u>	

Part I	Asset and Liability Statement		
1 Current value of plan assets and liabilities at the beginning and end of the plan year. Combine the value of plan assets held in more than one trust. Report the value of the plan's interest in a commingled fund containing the assets of more than one plan on a line-by-line basis unless the value is reportable on lines 1c(9) through 1c(14). Do not enter the value of that portion of an insurance contract which guarantees, during this plan year, to pay a specific dollar benefit at a future date. Round off amounts to the nearest dollar. MTIAs, CCTs, PSAs, and 103-12 IEs do not complete lines 1b(1), 1b(2), 1c(8), 1g, 1h, and 1i. CCTs, PSAs, and 103-12 IEs also do not complete lines 1d and 1e. See instructions.			
Assets		(a) Beginning of Year	(b) End of Year
a Total noninterest-bearing cash.....	1a		
b Receivables (less allowance for doubtful accounts):			
(1) Employer contributions.....	1b(1)		
(2) Participant contributions.....	1b(2)		
(3) Other.....	1b(3)		
c General investments:			
(1) Interest-bearing cash (include money market accounts & certificates of deposit).....	1c(1)		
(2) U.S. Government securities	1c(2)		
(3) Corporate debt instruments (other than employer securities):			
(A) Preferred	1c(3)(A)		
(B) All other	1c(3)(B)		
(4) Corporate stocks (other than employer securities):			
(A) Preferred	1c(4)(A)		
(B) Common.....	1c(4)(B)		
(5) Partnership/joint venture interests	1c(5)		
(6) Real estate (other than employer real property)	1c(6)		
(7) Loans (other than to participants).....	1c(7)		
(8) Participant loans.....	1c(8)	87424	106794
(9) Value of interest in common/collective trusts.....	1c(9)		
(10) Value of interest in pooled separate accounts	1c(10)	2262560	2385972
(11) Value of interest in master trust investment accounts.....	1c(11)		
(12) Value of interest in 103-12 investment entities	1c(12)		
(13) Value of interest in registered investment companies (e.g., mutual funds).....	1c(13)	59812444	49446633
(14) Value of funds held in insurance company general account (unallocated contracts).....	1c(14)	9638147	9965378
(15) Other	1c(15)		

1d Employer-related investments:		(a) Beginning of Year	(b) End of Year
(1) Employer securities	1d(1)		
(2) Employer real property	1d(2)		
e Buildings and other property used in plan operation	1e		
f Total assets (add all amounts in lines 1a through 1e)	1f	71800575	61904777

Liabilities

g Benefit claims payable	1g		
h Operating payables	1h		
i Acquisition indebtedness	1i		
j Other liabilities	1j		
k Total liabilities (add all amounts in lines 1g through 1j)	1k	0	0

Net Assets

l Net assets (subtract line 1k from line 1f)	1l	71800575	61904777
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Part II Income and Expense Statement

2 Plan income, expenses, and changes in net assets for the year. Include all income and expenses of the plan, including any trust(s) or separately maintained fund(s) and any payments/receipts to/from insurance carriers. Round off amounts to the nearest dollar. MTIAs, CCTs, PSAs, and 103-12 IEs do not complete lines 2a, 2b(1)(E), 2e, 2f, and 2g.

Income

		(a) Amount	(b) Total
a Contributions:			
(1) Received or receivable in cash from: (A) Employers	2a(1)(A)	1081327	
(B) Participants	2a(1)(B)	1181381	
(C) Others (including rollovers)	2a(1)(C)	512451	
(2) Noncash contributions	2a(2)		
(3) Total contributions. Add lines 2a(1)(A) , (B) , (C) , and line 2a(2)	2a(3)		2775159
b Earnings on investments:			
(1) Interest:			
(A) Interest-bearing cash (including money market accounts and certificates of deposit)	2b(1)(A)		
(B) U.S. Government securities	2b(1)(B)		
(C) Corporate debt instruments	2b(1)(C)		
(D) Loans (other than to participants)	2b(1)(D)		
(E) Participant loans	2b(1)(E)	5443	
(F) Other	2b(1)(F)	385700	
(G) Total interest. Add lines 2b(1)(A) through (F)	2b(1)(G)		391143
(2) Dividends: (A) Preferred stock	2b(2)(A)		
(B) Common stock	2b(2)(B)		
(C) Registered investment company shares (e.g. mutual funds)	2b(2)(C)	1018293	
(D) Total dividends. Add lines 2b(2)(A) , (B) , and (C)	2b(2)(D)		1018293
(3) Rents	2b(3)		
(4) Net gain (loss) on sale of assets: (A) Aggregate proceeds	2b(4)(A)		
(B) Aggregate carrying amount (see instructions)	2b(4)(B)		
(C) Subtract line 2b(4)(B) from line 2b(4)(A) and enter result	2b(4)(C)		0
(5) Unrealized appreciation (depreciation) of assets: (A) Real estate	2b(5)(A)		
(B) Other	2b(5)(B)		
(C) Total unrealized appreciation of assets. Add lines 2b(5)(A) and (B)	2b(5)(C)		0

		(a) Amount	(b) Total
(6) Net investment gain (loss) from common/collective trusts	2b(6)		
(7) Net investment gain (loss) from pooled separate accounts	2b(7)		196247
(8) Net investment gain (loss) from master trust investment accounts	2b(8)		
(9) Net investment gain (loss) from 103-12 investment entities.....	2b(9)		
(10) Net investment gain (loss) from registered investment companies (e.g., mutual funds)	2b(10)		-11910257
c Other income	2c		56698
d Total income. Add all income amounts in column (b) and enter total	2d		-7472717
Expenses			
e Benefit payment and payments to provide benefits:			
(1) Directly to participants or beneficiaries, including direct rollovers	2e(1)	2306055	
(2) To insurance carriers for the provision of benefits	2e(2)	10175	
(3) Other	2e(3)		
(4) Total benefit payments. Add lines 2e(1) through (3)	2e(4)		2316230
f Corrective distributions (see instructions)	2f		
g Certain deemed distributions of participant loans (see instructions)	2g		12505
h Interest expense	2h		
i Administrative expenses: (1) Professional fees	2i(1)		
(2) Contract administrator fees	2i(2)	94346	
(3) Investment advisory and management fees	2i(3)		
(4) Other	2i(4)		
(5) Total administrative expenses. Add lines 2i(1) through (4)	2i(5)		94346
j Total expenses. Add all expense amounts in column (b) and enter total	2j		2423081
Net Income and Reconciliation			
k Net income (loss). Subtract line 2j from line 2d	2k		-9895798
l Transfers of assets:			
(1) To this plan	2l(1)		
(2) From this plan	2l(2)		

Part III Accountant's Opinion

3 Complete lines 3a through 3c if the opinion of an independent qualified public accountant is attached to this Form 5500. Complete line 3d if an opinion is not attached.

a The attached opinion of an independent qualified public accountant for this plan is (see instructions):

(1) ☐ Unmodified (2) ☐ Qualified (3) ☒ Disclaimer (4) ☐ Adverse

b Check the appropriate box(es) to indicate whether the IQPA performed an ERISA section 103(a)(3)(C) audit. Check both boxes (1) and (2) if the audit was performed pursuant to both 29 CFR 2520.103-8 and 29 CFR 2520.103-12(d). Check box (3) if pursuant to neither.

(1) ☒ DOL Regulation 2520.103-8 (2) ☐ DOL Regulation 2520.103-12(d) (3) ☐ neither DOL Regulation 2520.103-8 nor DOL Regulation 2520.103-12(d).

c Enter the name and EIN of the accountant (or accounting firm) below:

(1) Name: **KKDLY, LLC**

(2) EIN: **99-0292355**

d The opinion of an independent qualified public accountant is **not attached** because:

(1) ☐ This form is filed for a CCT, PSA, or MTIA. (2) ☐ It will be attached to the next Form 5500 pursuant to 29 CFR 2520.104-50.

Part IV Compliance Questions

4 CCTs and PSAs do not complete Part IV. MTIAs, 103-12 IEs, and GIAs do not complete lines 4a, 4e, 4f, 4g, 4h, 4k, 4m, 4n, or 5. 103-12 IEs also do not complete lines 4j and 4l. MTIAs also do not complete line 4l.

During the plan year:

a Was there a failure to transmit to the plan any participant contributions within the time period described in 29 CFR 2510.3-102? Continue to answer "Yes" for any prior year failures until fully corrected. (See instructions and DOL's Voluntary Fiduciary Correction Program.)

	Yes	No	Amount
4a		X	

	Yes	No	Amount
b Were any loans by the plan or fixed income obligations due the plan in default as of the close of the plan year or classified during the year as uncollectible? Disregard participant loans secured by participant's account balance. (Attach Schedule G (Form 5500) Part I if "Yes" is checked.)			
4b		X	
c Were any leases to which the plan was a party in default or classified during the year as uncollectible? (Attach Schedule G (Form 5500) Part II if "Yes" is checked.)			
4c		X	
d Were there any nonexempt transactions with any party-in-interest? (Do not include transactions reported on line 4a. Attach Schedule G (Form 5500) Part III if "Yes" is checked.)			
4d		X	
e Was this plan covered by a fidelity bond?	X		500000
f Did the plan have a loss, whether or not reimbursed by the plan's fidelity bond, that was caused by fraud or dishonesty?		X	
4f		X	
g Did the plan hold any assets whose current value was neither readily determinable on an established market nor set by an independent third party appraiser?			
4g		X	
h Did the plan receive any noncash contributions whose value was neither readily determinable on an established market nor set by an independent third party appraiser?			
4h		X	
i Did the plan have assets held for investment? (Attach schedule(s) of assets if "Yes" is checked, and see instructions for format requirements.)	X		
4i	X		
j Were any plan transactions or series of transactions in excess of 5% of the current value of plan assets? (Attach schedule of transactions if "Yes" is checked and see instructions for format requirements.)			
4j		X	
k Were all the plan assets either distributed to participants or beneficiaries, transferred to another plan, or brought under the control of the PBGC?			
4k		X	
l Has the plan failed to provide any benefit when due under the plan?			
4l		X	
m If this is an individual account plan, was there a blackout period? (See instructions and 29 CFR 2520.101-3.)			
4m		X	
n If 4m was answered "Yes," check the "Yes" box if you either provided the required notice or one of the exceptions to providing the notice applied under 29 CFR 2520.101-3.			
4n			

5a Has a resolution to terminate the plan been adopted during the plan year or any prior plan year? ☐ Yes ☒ No
If "Yes," enter the amount of any plan assets that reverted to the employer this year _____.

5b If, during this plan year, any assets or liabilities were transferred from this plan to another plan(s), identify the plan(s) to which assets or liabilities were transferred. (See instructions.)

5b(1) Name of plan(s)	5b(2) EIN(s)	5b(3) PN(s)

5c Was the plan a defined benefit plan covered under the PBGC insurance program at any time during this plan year? (See ERISA section 4021 and instructions.) ☐ Yes ☐ No ☐ Not determined
If "Yes" is checked, enter the My PAA confirmation number from the PBGC premium filing for this plan year _____.

SCHEDULE R (Form 5500) Department of the Treasury Internal Revenue Service Department of Labor Employee Benefits Security Administration Pension Benefit Guaranty Corporation	Retirement Plan Information This schedule is required to be filed under sections 104 and 4065 of the Employee Retirement Income Security Act of 1974 (ERISA) and section 6058(a) of the Internal Revenue Code (the Code). ► File as an attachment to Form 5500.	OMB No. 1210-0110 2022 This Form is Open to Public Inspection.
For calendar plan year 2022 or fiscal plan year beginning 01/01/2022 and ending 12/31/2022		
A Name of plan W. M. KECK OBSERVATORY 403(B) RETIREMENT PLAN		B Three-digit plan number (PN) 001
C Plan sponsor's name as shown on line 2a of Form 5500 CALIFORNIA ASSOCIATION FOR RESEARCH IN ASTRONOMY		D Employer Identification Number (EIN) 95-3972799
Part I	Distributions	
All references to distributions relate only to payments of benefits during the plan year.		
1 Total value of distributions paid in property other than in cash or the forms of property specified in the instructions.....		1 0
2 Enter the EIN(s) of payor(s) who paid benefits on behalf of the plan to participants or beneficiaries during the year (if more than two, enter EINs of the two payors who paid the greatest dollar amounts of benefits): EIN(s): 82-2826183		
Profit-sharing plans, ESOPs, and stock bonus plans, skip line 3.		
3 Number of participants (living or deceased) whose benefits were distributed in a single sum, during the plan year.....		3
Part II	Funding Information (If the plan is not subject to the minimum funding requirements of section 412 of the Internal Revenue Code or ERISA section 302, skip this Part.)	
4 Is the plan administrator making an election under Code section 412(d)(2) or ERISA section 302(d)(2)? ☐ Yes ☐ No ☐ N/A If the plan is a defined benefit plan, go to line 8.		
5 If a waiver of the minimum funding standard for a prior year is being amortized in this plan year, see instructions and enter the date of the ruling letter granting the waiver. Date: Month _____ Day _____ Year _____ If you completed line 5, complete lines 3, 9, and 10 of Schedule MB and do not complete the remainder of this schedule.		
6 a Enter the minimum required contribution for this plan year (include any prior year accumulated funding deficiency not waived).....		6a
b Enter the amount contributed by the employer to the plan for this plan year.....		6b
c Subtract the amount in line 6b from the amount in line 6a. Enter the result (enter a minus sign to the left of a negative amount).....		6c
If you completed line 6c, skip lines 8 and 9.		
7 Will the minimum funding amount reported on line 6c be met by the funding deadline? ☐ Yes ☐ No ☐ N/A		
8 If a change in actuarial cost method was made for this plan year pursuant to a revenue procedure or other authority providing automatic approval for the change or a class ruling letter, does the plan sponsor or plan administrator agree with the change? ☐ Yes ☐ No ☐ N/A		
Part III	Amendments	
9 If this is a defined benefit pension plan, were any amendments adopted during this plan year that increased or decreased the value of benefits? If yes, check the appropriate box. If no, check the "No" box..... ☐ Increase ☐ Decrease ☐ Both ☐ No		
Part IV	ESOPs (see instructions). If this is not a plan described under section 409(a) or 4975(e)(7) of the Internal Revenue Code, skip this Part.	
10 Were unallocated employer securities or proceeds from the sale of unallocated securities used to repay any exempt loan?..... ☐ Yes ☐ No		
11 a Does the ESOP hold any preferred stock?..... ☐ Yes ☐ No		
b If the ESOP has an outstanding exempt loan with the employer as lender, is such loan part of a "back-to-back" loan? (See instructions for definition of "back-to-back" loan.)..... ☐ Yes ☐ No		
12 Does the ESOP hold any stock that is not readily tradable on an established securities market?..... ☐ Yes ☐ No		
For Paperwork Reduction Act Notice, see the Instructions for Form 5500.		
Schedule R (Form 5500) 2022 v. 220413		

Part V Additional Information for Multiemployer Defined Benefit Pension Plans

13 Enter the following information for each employer that (1) contributed more than 5% of total contributions to the plan during the plan year or (2) was one of the top-ten highest contributors (measured in dollars). See instructions. *Complete as many entries as needed to report all applicable employers.*

a Name of contributing employer

b EIN

c Dollar amount contributed by employer

d Date collective bargaining agreement expires (If employer contributes under more than one collective bargaining agreement, check box ☐ and see instructions regarding required attachment. Otherwise, enter the applicable date.) Month _____ Day _____ Year _____

e Contribution rate information (If more than one rate applies, check this box ☐ and see instructions regarding required attachment. Otherwise, complete lines 13e(1) and 13e(2).)

(1) Contribution rate (in dollars and cents) _____

(2) Base unit measure: ☐ Hourly ☐ Weekly ☐ Unit of production ☐ Other (specify): _____

a Name of contributing employer

b EIN

c Dollar amount contributed by employer

d Date collective bargaining agreement expires (If employer contributes under more than one collective bargaining agreement, check box ☐ and see instructions regarding required attachment. Otherwise, enter the applicable date.) Month _____ Day _____ Year _____

e Contribution rate information (If more than one rate applies, check this box ☐ and see instructions regarding required attachment. Otherwise, complete lines 13e(1) and 13e(2).)

(1) Contribution rate (in dollars and cents) _____

(2) Base unit measure: ☐ Hourly ☐ Weekly ☐ Unit of production ☐ Other (specify): _____

a Name of contributing employer

b EIN

c Dollar amount contributed by employer

d Date collective bargaining agreement expires (If employer contributes under more than one collective bargaining agreement, check box ☐ and see instructions regarding required attachment. Otherwise, enter the applicable date.) Month _____ Day _____ Year _____

e Contribution rate information (If more than one rate applies, check this box ☐ and see instructions regarding required attachment. Otherwise, complete lines 13e(1) and 13e(2).)

(1) Contribution rate (in dollars and cents) _____

(2) Base unit measure: ☐ Hourly ☐ Weekly ☐ Unit of production ☐ Other (specify): _____

a Name of contributing employer

b EIN

c Dollar amount contributed by employer

d Date collective bargaining agreement expires (If employer contributes under more than one collective bargaining agreement, check box ☐ and see instructions regarding required attachment. Otherwise, enter the applicable date.) Month _____ Day _____ Year _____

e Contribution rate information (If more than one rate applies, check this box ☐ and see instructions regarding required attachment. Otherwise, complete lines 13e(1) and 13e(2).)

(1) Contribution rate (in dollars and cents) _____

(2) Base unit measure: ☐ Hourly ☐ Weekly ☐ Unit of production ☐ Other (specify): _____

a Name of contributing employer

b EIN

c Dollar amount contributed by employer

d Date collective bargaining agreement expires (If employer contributes under more than one collective bargaining agreement, check box ☐ and see instructions regarding required attachment. Otherwise, enter the applicable date.) Month _____ Day _____ Year _____

e Contribution rate information (If more than one rate applies, check this box ☐ and see instructions regarding required attachment. Otherwise, complete lines 13e(1) and 13e(2).)

(1) Contribution rate (in dollars and cents) _____

(2) Base unit measure: ☐ Hourly ☐ Weekly ☐ Unit of production ☐ Other (specify): _____

a Name of contributing employer

b EIN

c Dollar amount contributed by employer

d Date collective bargaining agreement expires (If employer contributes under more than one collective bargaining agreement, check box ☐ and see instructions regarding required attachment. Otherwise, enter the applicable date.) Month _____ Day _____ Year _____

e Contribution rate information (If more than one rate applies, check this box ☐ and see instructions regarding required attachment. Otherwise, complete lines 13e(1) and 13e(2).)

(1) Contribution rate (in dollars and cents) _____

(2) Base unit measure: ☐ Hourly ☐ Weekly ☐ Unit of production ☐ Other (specify): _____

14 Enter the number of deferred vested and retired participants (inactive participants), as of the beginning of the plan year, whose contributing employer is no longer making contributions to the plan for:	14a		
a The current plan year. Check the box to indicate the counting method used to determine the number of inactive participants: ☐ last contributing employer ☐ alternative ☐ reasonable approximation (see instructions for required attachment).....		14b	
b The plan year immediately preceding the current plan year. ☐ Check the box if the number reported is a change from what was previously reported (see instructions for required attachment)			14c
c The second preceding plan year. ☐ Check the box if the number reported is a change from what was previously reported (see instructions for required attachment)			
15 Enter the ratio of the number of participants under the plan on whose behalf no employer had an obligation to make an employer contribution during the current plan year to:	15a		
a The corresponding number for the plan year immediately preceding the current plan year.....		15b	
b The corresponding number for the second preceding plan year.....			
16 Information with respect to any employers who withdrew from the plan during the preceding plan year:	16a		
a Enter the number of employers who withdrew during the preceding plan year		16b	
b If line 16a is greater than 0, enter the aggregate amount of withdrawal liability assessed or estimated to be assessed against such withdrawn employers.....			
17 If assets and liabilities from another plan have been transferred to or merged with this plan during the plan year, check box and see instructions regarding supplemental information to be included as an attachment ☐			

Part VI Additional Information for Single-Employer and Multiemployer Defined Benefit Pension Plans

18 If any liabilities to participants or their beneficiaries under the plan as of the end of the plan year consist (in whole or in part) of liabilities to such participants and beneficiaries under two or more pension plans as of immediately before such plan year, check box and see instructions regarding supplemental information to be included as an attachment ☐

19 If the total number of participants is 1,000 or more, complete lines (a) through (c)

a Enter the percentage of plan assets held as:
 Stock: _____% Investment-Grade Debt: _____% High-Yield Debt: _____% Real Estate: _____% Other: _____%

b Provide the average duration of the combined investment-grade and high-yield debt:
☐ 0-3 years ☐ 3-6 years ☐ 6-9 years ☐ 9-12 years ☐ 12-15 years ☐ 15-18 years ☐ 18-21 years ☐ 21 years or more

c What duration measure was used to calculate line 19(b)?
☐ Effective duration ☐ Macaulay duration ☐ Modified duration ☐ Other (specify): _____

20 PBGC missed contribution reporting requirements. If this is a multiemployer plan or a single-employer plan that is not covered by PBGC, skip line 20.

a Is the amount of unpaid minimum required contributions for all years from Schedule SB (Form 5500) line 40 greater than zero? ☐ Yes ☐ No

b If line 20a is "Yes," has PBGC been notified as required by ERISA sections 4043(c)(5) and/or 303(k)(4)? Check the applicable box:

☐ Yes.

☐ No. Reporting was waived under 29 CFR 4043.25(c)(2) because contributions equal to or exceeding the unpaid minimum required contribution were made by the 30th day after the due date.

☐ No. The 30-day period referenced in 29 CFR 4043.25(c)(2) has not yet ended, and the sponsor intends to make a contribution equal to or exceeding the unpaid minimum required contribution by the 30th day after the due date.

☐ No. Other. Provide explanation _____



W. M. Keck Observatory 403(b) Retirement Plan

Financial Statements and Supplemental Schedule
(With Independent Auditors' Report Thereon)

December 31, 2022 and 2021

W. M. KECK OBSERVATORY 403(b) RETIREMENT PLAN

Financial Statements and Supplemental Schedule

December 31, 2022 and 2021

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Schedules other than that listed above have been omitted because they are not applicable or are not required by 29 CFR 2520.103-10 of the Department of Labor's Rules and Regulations for Reporting and Disclosure under the Employee Retirement Income Security Act of 1974, as amended.

Independent Auditors' Report

The Participants and Administrative Committee
W. M. Keck Observatory 403(b) Retirement Plan:

Scope and Nature of the ERISA Section 103(a)(3)(C) Audit

We were engaged to perform audits of the financial statements of the W. M. Keck Observatory 403(b) Retirement Plan (the Plan), an employee benefit plan subject to the Employee Retirement Income Security Act of 1974 (ERISA), as permitted by ERISA Section 103(a)(3)(C) (ERISA Section 103(a)(3)(C) audit). The financial statements comprise the statements of net assets available for benefits as of December 31, 2022 and 2021, and the related statements of changes in net assets available for benefits for the years then ended, and the related notes to financial statements.

Management, having determined it is permissible in the circumstances, has elected to have the audits of the Plan's financial statements performed in accordance with ERISA Section 103(a)(3)(C) pursuant to 29 CFR 2520.103-8 of the Department of Labor's Rules and Regulations for Reporting and Disclosure under ERISA. As permitted by ERISA Section 103(a)(3)(C), our audits need not extend to any statements or information related to assets held for investment of the Plan (investment information) by a bank or similar institution or insurance carrier that is regulated, supervised, and subject to periodic examination by a state or federal agency, provided that the statements or information regarding assets so held are prepared and certified to by the bank or similar institution or insurance carrier in accordance with 29 CFR 2520.103-5 of the Department of Labor's Rules and Regulations for Reporting and Disclosure under ERISA (qualified institution).

Management has obtained certifications from a qualified institution as of December 31, 2022 and 2021, and for the years then ended, stating that the certified investment information, as described in Note 3 to the financial statements, is complete and accurate.

Disclaimer of Opinion

We do not express an opinion on the accompanying financial statements of the Plan. Because of the significance of the matter described in the *Basis for Disclaimer of Opinion* section of our report, we have not been able to obtain sufficient appropriate audit evidence to provide a basis for an audit opinion on the financial statements.

Basis for Disclaimer of Opinion

As described in Note 2 to the financial statements, the Plan has not maintained, and TIAA and CREF did not make available, complete historical records relating to certain annuity and custodial accounts issued to current and former employees prior to October 1, 2008. Accordingly, we were unable to apply auditing procedures sufficient to determine the extent to which the financial statements may have been affected by these conditions.

Responsibilities of Management for the Financial Statements

Management is responsible for the preparation and fair presentation of the financial statements in accordance with accounting principles generally accepted in the United States of America, and for the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error. Management's election of the ERISA Section 103(a)(3)(C) audit does not affect management's responsibility for the financial statements.

In preparing the financial statements, management is required to evaluate whether there are conditions or events, considered in the aggregate, that raise substantial doubt about the Plan's ability to continue as a going concern for one year after the date that the financial statements are available to be issued.

Management is also responsible for maintaining a current plan instrument, including all plan amendments; administering the Plan; and determining that the Plan's transactions that are presented and disclosed in the financial statements are in conformity with the Plan's provisions, including maintaining sufficient records with respect to each of the participants, to determine the benefits due or which may become due to such participants.

Auditors' Responsibilities for the Audit of the Financial Statements

Our responsibility is to conduct an audit of the Plan's financial statements in accordance with auditing standards generally accepted in the United States of America and to issue an auditors' report. However, because of the matter described in the *Basis for Disclaimer of Opinion* section of our report, we were not able to obtain sufficient appropriate audit evidence to provide a basis for an audit opinion on these financial statements.

We are required to be independent of the Plan, and to meet our other ethical responsibilities, in accordance with the relevant ethical requirements relating to our audits.

Other Matter – Supplemental Schedule Required by ERISA

The supplemental schedule H, line 4i – Schedule of Assets (Held at End of Year) as of December 31, 2022, is presented for purposes of additional analysis and is not a required part of the financial statements but is supplementary information required by the Department of Labor's Rules and Regulations for Reporting and Disclosure under ERISA. Such information is the responsibility of management and was derived from and relates directly to the underlying accounting and other records used to prepare the financial statements. Because of the significance of the matter described in the *Basis for Disclaimer of Opinion* section, it is inappropriate to and we do not express an opinion on the supplemental schedule referred to above.

KKDLV LLC

Honolulu, Hawaii
June 13, 2023

W. M. KECK OBSERVATORY 403(b) RETIREMENT PLAN

Statements of Net Assets Available for Benefits

December 31, 2022 and 2021

	2022	2021
Assets:		
Investments at fair value	\$ 59,689,118	\$ 69,510,442
Investments at contract value	<u>2,108,865</u>	<u>2,202,709</u>
Total investments	61,797,983	71,713,151
Notes receivable from participants	<u>106,794</u>	<u>87,424</u>
Net assets available for benefits	<u><u>\$ 61,904,777</u></u>	<u><u>\$ 71,800,575</u></u>

See accompanying independent auditors' report and notes to financial statements.

W. M. KECK OBSERVATORY 403(b) RETIREMENT PLAN

Statements of Changes in Net Assets Available for Benefits

Years Ended December 31, 2022 and 2021

	2022	2021
Additions (deductions):		
Investment income (loss):		
Net appreciation (depreciation) in fair value of investments	\$ (11,657,312)	\$ 7,031,176
Interest and dividend income	1,403,993	1,718,632
Total investment income (loss), net	(10,253,319)	8,749,808
Interest income on notes receivable from participants	5,443	4,683
Contributions:		
Participant	1,181,381	1,137,039
Employer	1,081,327	1,035,140
Rollover	512,451	-
Total contributions	2,775,159	2,172,179
Benefits paid to participants and beneficiaries	(2,328,735)	(3,010,596)
Administrative expenses	(94,346)	(36,608)
Net increase (decrease)	(9,895,798)	7,879,466
Net assets available for benefits:		
Beginning of year	71,800,575	63,921,109
End of year	\$ 61,904,777	\$ 71,800,575

See accompanying independent auditors' report and notes to financial statements.

W. M. KECK OBSERVATORY 403(b) RETIREMENT PLAN

Notes to Financial Statements

December 31, 2022 and 2021

(1) Description of Plan

The following description of the W. M. Keck Observatory 403(b) Retirement Plan (the Plan), formerly known as the California Association for Research in Astronomy Retirement Contribution Plan, provides only general information. Participants should refer to the plan document for a more complete description of the Plan's provisions.

General

The Plan is a defined contribution plan established by the California Association for Research in Astronomy dba W. M. Keck Observatory (the Observatory) to provide benefits to eligible employees, as defined in the plan document. The Plan is subject to the provisions of the Internal Revenue Code (IRC) and the provisions of the Employee Retirement Income Security Act of 1974 (ERISA), as amended.

All employees of the Observatory are eligible upon hire to make pre-tax deferrals or Roth elective deferrals. Employees must be 21 years of age and, effective October 1, 2016, must be employed with the Observatory for six months in order to be eligible for mandatory employee contributions or employer contributions. Additionally, employees regularly scheduled to work less than 20 hours per week but not more than 1,000 hours during a calendar year, leased employees, temporary employees of less than one year, contracted employees, casual employees, intermittent employees and students, and any individual who is not treated as an employee of the Observatory, are not eligible to participate in mandatory employee contributions or employer contributions. If the employee were eligible to participate in the Plan prior to any amendments, the employee will continue to be eligible without satisfying any additional age or service requirements.

Contributions

Participants in the Plan enter into a written salary reduction agreement with the Observatory requiring mandatory pre-tax contributions equal to 4% of compensation up to a maximum allowable under the IRC. Additionally, participants may contribute up to 100% of their annual eligible compensation, as defined in the Plan, up to the maximum allowable under the IRC. A participant may elect after-tax contributions to a Roth elective deferral account in addition to or in substitution of a participant's pre-tax salary deferral contributions. Additionally, participants who attain the age of 50 before the end of a calendar year may elect to make catch-up contributions to the Plan, not to exceed the amount allowable under current income tax regulations. Participants may also contribute rollover amounts representing distributions from other qualified defined benefit or defined contribution plans. Contributions are deposited in the appropriate investment fund as directed by the participants.

All eligible participants who make participant plan contributions will receive an Observatory Employer Contribution ranging from 8% to 14% based on certain criteria as defined in the plan document. During the years ended December 31, 2022 and 2021, employer contributions to the Plan were \$1,081,327 and \$1,035,140, respectively.

W. M. KECK OBSERVATORY 403(b) RETIREMENT PLAN

Notes to Financial Statements

December 31, 2022 and 2021

Participant Accounts

Each participant's account is credited with the participant's contributions, employer contributions, and allocations of plan earnings or losses. Allocations of plan earnings or losses are based on participant account balances, as defined. The benefit to which a participant is entitled is the benefit that can be provided from the participant's account. Participants direct the investment of their account balances into various investment options offered by the Plan.

Vesting

Both participant and employer contributions, and earnings or losses thereon, are fully vested and nonforfeitable immediately when made.

Plan Loans

Participants may obtain loans through Teachers Insurance and Annuity Association of America (TIAA). The participant must pledge collateral equal to 110% of the loan balance. The collateral for the loans must be held in the TIAA Traditional Annuity account. The loans are secured by the balance in the participant's account and bear a fixed interest rate of 8.00% established by TIAA. Loan repayments are made ratably over a period not to exceed five years, unless used to purchase a primary residence, in which case loan repayments will mature within a reasonable period.

The loans are not shown in the Plan's statements of net assets available for benefits, as the loans are not made from plan assets and are therefore not considered assets of the Plan. Payments on the loans are made in equal amounts over the loan term by the participant directly to TIAA. If a loan is in default, a non-distributable amount invested in the TIAA Traditional Annuity account is included in the Plan's financial statements until a triggering or distributable event occurs, at which time it is used to repay the defaulted amount to TIAA. As of December 31, 2022 and 2021, there were 15 and 23 loans outstanding with balances of \$91,797 and \$178,508, respectively.

Notes Receivable from Participants

Participants may borrow from their account funds a minimum of \$1,000 up to a maximum equal to the lesser of \$50,000 reduced by the highest outstanding loan balance of the participant during the preceding 12 months or 50% of their vested account balance provided the loan is paid back with interest within five years. However, if the loan is for the purchase of a participant's principal residence, the plan administrator may permit a longer repayment term. The loans are secured by the vested balance in the participant's account and bear interest at rates that are commensurate with local prevailing rates as determined by the plan administrator. Current interest rates range from 4.25% to 7.25%. Principal and interest are paid ratably directly by the participant.

W. M. KECK OBSERVATORY 403(b) RETIREMENT PLAN

Notes to Financial Statements

December 31, 2022 and 2021

Payment of Benefits

Upon termination of service, death, disability, or retirement, a participant or beneficiary may elect to receive benefits as either a lump sum amount, installment amount, annuity-based calculated payment, or a single sum distribution of a portion of an account. Additionally, under certain circumstances of financial hardship, a participant is allowed to withdraw funds from the Plan.

Administrative Expenses

Reasonable administrative expenses related to plan administration are paid from plan assets, except the Observatory may, at its discretion, pay such expenses. Expenses paid directly by the Observatory are excluded from these financial statements. During the year ended December 31, 2022 and 2021, administrative expenses charged directly to participant accounts amounted to \$54,838 and \$12,206, respectively. Fees paid by the Plan for investment management services are included as a reduction of the return earned on each investment fund in the statements of changes in net assets available for benefits.

The Plan also has a revenue credit arrangement whereby the Plan receives a revenue credit from TIAA if the Plan maintains a balance in and makes active contributions to certain investments. During the year ended December 31, 2022 and 2021, the Plan funded \$39,807 and \$24,627, respectively, of plan expenses to pay professional fees using the revenue credit amounts. As of December 31, 2022 and 2021, the balance of this revenue credit amounted to \$57,127 and \$126,182, respectively, and is included in investments at contract value in the accompanying statements of net assets available for benefits.

(2) Summary of Significant Accounting Policies

Basis of Accounting

The accompanying financial statements of the Plan are prepared on the accrual basis of accounting in accordance with accounting principles generally accepted in the United States of America (GAAP).

Beginning with the Form 5500 filing for the 2009 plan year, “large” ERISA covered 403(b) plans (generally plans with 100 or more participants) were required to file audited financial statements with their Form 5500. Prior to October 1, 2008, Teachers Insurance and Annuity Association of America and College Retirement Equities Fund (TIAA and CREF) maintained records at a contract, not plan level. TIAA and CREF administratively decided not to provide accounting records and supporting documentation at the participant or plan level relating to certain annuity and custodial accounts issued to current and former employees prior to October 1, 2008. As such, neither the plan sponsor nor TIAA and CREF have been able to produce sufficient accounting records and

W. M. KECK OBSERVATORY 403(b) RETIREMENT PLAN

Notes to Financial Statements

December 31, 2022 and 2021

supporting documents relating to certain annuity and custodial accounts issued to current and former employees prior to October 1, 2008. As a result, the completeness and the accuracy of the annuity and custodial accounts, and related investment income and distributions related to these accounts, if any, could not be determined.

Use of Estimates

The preparation of financial statements in accordance with GAAP requires the Plan's management to make estimates and assumptions that affect the reported amounts of assets and liabilities and changes therein, and disclosure of contingent assets and liabilities. Actual results could differ from those estimates.

Investment Valuation and Income Recognition

The investments of the Plan are stated at fair value, with the exception of fully benefit-responsive (FBR) investment contracts. Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. The Plan's Administrative Committee determines the Plan's valuation policies utilizing information provided by investment advisers and TIAA and CREF. See Note 4 for discussion of fair value measurements.

FBR investment contracts with TIAA (Note 5) are valued at contract value. Contract value equals the accumulated cash contributions and interest credited less distributions to the contracts.

Purchases and sales of the investments within the Plan are reflected on a trade-date basis. Dividend income is recorded on the ex-dividend date. Interest income is recorded on the accrual basis. Net appreciation (depreciation) includes the Plan's gains and losses on investments bought and sold as well as held during the year.

Notes Receivable From Participants

Notes receivable from participants are measured at their unpaid principal balance plus any accrued but unpaid interest. Interest income is recorded on the accrual basis. Related fees are recorded as administrative expenses and are expensed when they are incurred.

Risks and Uncertainties

The Plan provides for various investment options in any combination of investment securities offered by the Plan. Investment securities are exposed to various risks such as interest rate, market, and credit risks. Due to the level of risk associated with certain investment securities, it is at least reasonably possible that changes in the values of investment securities will occur in the near term and that such changes could materially affect participants' account balances and the amounts reported in the statements of net assets available for benefits.

W. M. KECK OBSERVATORY 403(b) RETIREMENT PLAN

Notes to Financial Statements

December 31, 2022 and 2021

Payment of Benefits

Benefits are recorded when paid.

(3) Information Certified by TIAA and CREF

The Plan administrator has elected the method of annual reporting compliance permitted by 29 CFR 2520.103-8 of the Department of Labor's Rules and Regulations for Reporting and Disclosure under ERISA. Accordingly, TIAA and CREF has certified that the following data included in the accompanying financial statements and supplemental schedule is complete and accurate:

December 31:	2022	2021
Investments at fair value	\$ 59,689,118	\$ 69,510,442
Investments at contract value	2,108,865	2,202,709
Notes receivable from participants	106,794	87,424
Year Ended December 31:	2022	2021
Net appreciation (depreciation) in fair value of investments	\$ (11,657,312)	\$ 7,031,176
Interest and dividend income	1,403,993	1,718,632
Interest income on notes receivable from participants	5,443	4,683

The Plan's independent auditors did not perform auditing procedures with respect to this information, except for comparing such information with the related information included in the financial statements and supplemental schedule.

(4) Fair Value Measurements

The accounting guidance for fair value measurements establishes a fair value hierarchy that prioritizes the inputs to valuation techniques used to measure fair value. The hierarchy gives the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (level 1 measurements) and the lowest priority to unobservable inputs (level 3 measurements). The three levels of the fair value hierarchy are described below:

Level 1 - Inputs to the valuation methodology are unadjusted quoted prices for identical assets or liabilities in active markets that the Plan has the ability to access.

W. M. KECK OBSERVATORY 403(b) RETIREMENT PLAN

Notes to Financial Statements

December 31, 2022 and 2021

Level 2 - Inputs to the valuation methodology include:

- Quoted prices for similar assets or liabilities in active markets;
- Quoted prices for identical or similar assets or liabilities in inactive markets;
- Inputs other than quoted prices that are observable for the asset or liability;
- Inputs that are derived principally from or corroborated by observable market data by correlation or other means.

If the asset or liability has a specified (contractual) term, the level 2 input must be observable for substantially the full term of the asset or liability.

Level 3 - Inputs to the valuation methodology are unobservable and significant to the fair value measurement.

The asset or liability's fair value measurement level within the fair value hierarchy is based on the lowest level of any input that is significant to the fair value measurement. Valuation techniques maximize the use of relevant observable inputs and minimize the use of unobservable inputs.

The following is a description of the valuation methodologies used for assets measured at fair value. There have been no changes in the methodologies used at December 31, 2022 and 2021:

Registered investments - mutual funds: Mutual funds are registered investments with various investment managers. The fair value of these investments are determined by reference to the fund's underlying assets, which are principally marketable equities and fixed income securities. Mutual funds are valued at the daily closing price as reported by the fund. Mutual funds held by the Plan are open-end mutual funds that are registered with the Securities and Exchange Commission. These funds are required to publish their daily net asset value (NAV) and to transact at that price. The mutual funds held by the Plan are deemed to be actively traded.

Fixed annuity contracts - NFBR: The non-fully benefit-responsive (NFBR) fixed annuity contracts consist solely of the TIAA Traditional Annuity Contracts, which are reported at fair value, which is approximated by contract value. Fair value is determined using a discounted cash flow model/theoretical transfer (exit value). The contract value equals the accumulated cash contributions and interest credited to the Plan's contracts and transfers, if any, less any withdrawals and transfers, if any. As these investments are contract-based, observable prices for identical or similar investments do not exist and accordingly, these investments are valued using unobservable inputs (level 3).

W. M. KECK OBSERVATORY 403(b) RETIREMENT PLAN

Notes to Financial Statements

December 31, 2022 and 2021

Pooled separate account: Units held in the pooled separate account are valued at NAV based daily on the fair market value of the underlying real estate holdings or other real estate-related investments, less any liabilities. The NAV as provided by TIAA, is used as a practical expedient to estimate fair value. The underlying investments are valued principally utilizing external appraisals or for securities, values obtained from independent pricing sources. Appraisals can be subjective in certain respects and rely on a variety of assumptions (including comparable property sales and historic pricing) and conditions at that property or in the market in which the property is located, which may change materially after the appraisal is conducted. Among other things, market prices for comparable real estate may be volatile in particular if there has been a lack of recent transaction activity in such market. There are no unfunded commitments from participants in the Plan who invest in this account.

The pooled separate account provides participants with a liquidity guarantee enabling the account to have funds available to meet participant redemption, transfer, or cash withdrawals. TIAA guarantees that participants can redeem their accumulation unit value determined after their transfer or cash withdrawal request is received in good order. Withdrawals from the pooled separate account are limited to once per calendar quarter.

The preceding measurements described may produce a fair value calculation that may not be indicative of net realizable value or reflective of future fair values. Furthermore, although the Plan believes its valuation methods are appropriate and consistent with other market participants, the use of different methodologies or assumptions to determine the fair value of certain financial instruments could result in a different fair value measurement at the reporting date.

The following tables set forth by level within the fair value hierarchy the Plan's investments measured at fair value as of December 31, 2022 and 2021:

Investment Assets at Fair Value as of December 31, 2022				
	Total	Level 1	Level 2	Level 3
Registered investments	\$ 49,446,633	\$ -	\$ 49,446,633	\$ -
Fixed annuity contract-NFBR	7,856,513	-	-	7,856,513
Total	57,303,146	\$ -	\$ 49,446,633	\$ 7,856,513
Investments measured at net asset value ^(a)	2,385,972			
Total investments at fair value	\$ 59,689,118			

W. M. KECK OBSERVATORY 403(b) RETIREMENT PLAN

Notes to Financial Statements

December 31, 2022 and 2021

Investment Assets at Fair Value as of December 31, 2021				
	Total	Level 1	Level 2	Level 3
Registered investments	\$ 59,812,444	\$ -	\$ 59,812,444	\$ -
Fixed annuity contract-NFBR	7,435,438	-	-	7,435,438
Total	67,247,882	\$ -	\$ 59,812,444	\$ 7,435,438
Investments measured at net asset value ^(a)	2,262,560			
Total investments at fair value	\$ 69,510,442			

^(a) Investments held in a pooled separate account were measured at fair value using the NAV per share (or its equivalent) practical expedient and have not been classified in the fair value hierarchy. The fair value amounts presented in the tables are intended to permit reconciliation of the fair value hierarchy to the line item presented in the statements of net assets available for benefits.

Changes in Fair Value of Level 3 Assets

The availability of observable market data is monitored to assess the appropriate classification of financial instruments within the fair value hierarchy. Changes in economic conditions or model-based valuation techniques may require the transfer of financial instruments from one fair value level to another.

Plan management evaluated the significance of transfers between levels based upon the nature of the financial instrument and size of the transfer relative to total net assets available for benefits. For the year ended December 31, 2022 and 2021, there were no transfers into or out of level 3.

The following table sets forth a summary of certain changes in the fair value of the Plan's level 3 assets for the year ended December 31, 2022 and 2021:

Fixed Annuity Contracts - NFBR		
	2022	2021
Purchases	\$ 512,643	\$ 576,887

W. M. KECK OBSERVATORY 403(b) RETIREMENT PLAN

Notes to Financial Statements

December 31, 2022 and 2021

Quantitative Information About Significant Unobservable Inputs Used in Level 3 Fair Value Measurements

The following table represents the Plan's level 3 financial instruments, the valuation techniques used to measure the fair value of those financial instruments as of December 31, 2022 and 2021, respectively, and the significant unobservable inputs and the ranges of values for those inputs:

Type	Fair Value December 31, 2022	Fair Value December 31, 2021	Principal Valuation Technique	Significant Unobservable Inputs	Range
TIAA Traditional Annuity Contracts (RA, GRA, & RC)	\$ 7,856,513	\$ 7,435,438	Discounted cash flow / theoretical transfer (exit value)	Risk-adjusted discount rate applied	4.00% - 6.85%

(5) TIAA Traditional Annuity

The TIAA Traditional Annuity is an unallocated fixed annuity contract that is fully and unconditionally guaranteed by TIAA. The Plan invests in both fully and non-fully benefit-responsive traditional annuity contracts with TIAA. TIAA maintains contributions in general accounts and those accounts are credited with earnings on the underlying investments and charged with participant withdrawals and administrative expenses. TIAA is contractually obligated to repay the principal and a specified guaranteed interest, backed by the claims-paying ability of TIAA. The type of contract through which a participant invests in the TIAA Traditional Annuity determines the applicability of certain account features, such as the guaranteed minimum interest rate, additional interest declarations, the degree of liquidity of the participant's account, and the options for receiving income upon retirement. The six investment options offered by the Plan include Retirement Annuities (RA), Group Retirement Annuities (GRA), Supplemental Retirement Annuities (SRA), Group Supplemental Retirement Annuities (GSRA), Retirement Choice Annuities (RC), and Retirement Choice Plus Annuities (RCP).

When participants choose to allocate a portion of their retirement savings to the TIAA Traditional Annuity during the accumulation phase of the contract, their contributions purchase a specific amount of lifetime income based on the contractual rate schedule in effect at the time the premium is paid. The participant's principal, plus a specified minimum rate of interest of between 1.00% and 3.00%, is guaranteed by TIAA's claims-paying ability. The TIAA Traditional Annuity also provides the potential for additional interest if declared by TIAA's Board of Trustees. Additional interest, when declared, remains in effect for the declaration year, which begins each March 1. Additional interest is not guaranteed for future years. Together, the guaranteed minimum and additional amounts make up the crediting interest rates. The crediting interest rate is based on a formula agreed upon with the issuer, but it may not be less than the guaranteed minimum.

W. M. KECK OBSERVATORY 403(b) RETIREMENT PLAN

Notes to Financial Statements

December 31, 2022 and 2021

Fully Benefit-Responsive Contracts

The SRA, GSRA, and RCP contracts are all fully benefit-responsive. Participants may ordinarily direct the withdrawal or transfer of all or a portion of their investment at contract value without restriction. There are no reserves against contract value for credit risk of the contract issuer or otherwise.

These contracts allow for transfers and withdrawals. When a participant transfers out of the annuity and transfers back in within 120 days, the amount, up to the original transfer, is credited with the same interest rates that would have applied if the transfer out had not taken place. Such interest is credited from the date the transfer in was made. Interest will not be paid for the period from the date of transfer out to the date of transfer in. This provision is designed to discourage switching solely for the purposes of obtaining higher interest rates.

Certain events limit the ability of the Plan to transact at contract value with the issuer. Such events include the following: (1) amendments to the plan documents (including complete or partial plan termination or merger with another plan), (2) changes to the Plan's prohibition on competing investment options or deletion of equity wash provisions, (3) bankruptcy of the plan sponsor or other plan sponsor events (for example, divestitures or spin-offs of a subsidiary) that cause a significant withdrawal from the Plan, or (4) the failure of the Plan to qualify for exemption from federal income taxes or any required prohibited transaction exemption under ERISA. The plan administrator does not believe that any events which would limit the Plan's ability to transact at contract value with participants are probable of occurring.

The contracts do not permit the insurance company to terminate the agreement prior to the scheduled maturity date. The crediting rate for the plan year ended 2022 ranged from 3.85% to 6.10%. At December 31, 2022 and 2021, the value of the fully benefit-responsive fixed annuity contracts totaled \$2,108,865, and \$2,202,709, respectively.

Non-Fully Benefit-Responsive Contracts

The RA account balances may only be withdrawn over 10 annual payments. For the GRA account balances, lump-sum withdrawals are available from the annuity only within 120 days after termination of employment and are subject to a 2.50% surrender charge. All other withdrawals and transfers from the account must be spread over 10 annual payments (over 5 years for withdrawals after termination of employment, over seven years for RC contracts). Because this provision is considered to restrict participants' "reasonable access" to their contract balances, RAs, GRAs, and RCs are not considered fully benefit-responsive investment contracts.

The crediting rate for the plan year ended 2022 ranged from 4.60% to 6.85%. At December 31, 2022 and 2021, the value of the non-fully benefit-responsive fixed annuity contracts totaled \$7,856,513 and \$7,435,438, respectively.

W. M. KECK OBSERVATORY 403(b) RETIREMENT PLAN

Notes to Financial Statements

December 31, 2022 and 2021

(6) Tax Status

The Plan is based on the ERISA 403(b) volume submitter plan sponsored by TIAA. This volume submitter 403(b) plan has been filed with the appropriate agency and has obtained an opinion letter dated August 7, 2017, from the Internal Revenue Service (IRS) stating that the volume submitter 403(b) plan constitutes a qualified plan under Section 403(b) of the IRC. Although the Plan has been amended since receiving the opinion letter, the plan administrator believes the Plan is currently designed and being operated in compliance with the applicable requirements of the IRC to maintain the tax-exempt status for plan participants under Section 403(b).

GAAP requires plan management to evaluate tax positions taken by the Plan and recognize a tax liability (or asset) if the Plan has taken an uncertain tax position that more likely than not would not be sustained upon examination by the IRS. The Plan is subject to routine audits by taxing jurisdictions; however, there are currently no audits for any tax periods in progress.

(7) Related-Party Transactions

Certain plan investments are managed by TIAA and CREF. Such transactions, while considered party-in-interest transactions under ERISA regulations, are permitted under the provisions of the Plan and are specifically exempt from the prohibition of party-in-interest transactions under ERISA.

(8) Economic Uncertainties

The COVID-19 pandemic, together with recent geopolitical events and rising inflation, has adversely affected the global economy by, among other things, disrupting supply chains, and creating significant volatility and disruption in financial markets. The full impact of these matters on the economy, the Observatory, and on the Plan is uncertain.

(9) Plan Termination

Although it has not expressed any intent to do so, the Observatory has the right under the Plan to discontinue its contributions at any time and to terminate the Plan subject to the provisions of ERISA. In the event of plan termination, participants will remain fully vested in their accounts.

(10) Subsequent Events

The Plan has evaluated subsequent events through June 13, 2023, the date at which the accompanying financial statements were available to be issued, and determined there are no items to disclose.

W. M. KECK OBSERVATORY 403(b) RETIREMENT PLAN

Notes to Financial Statements

December 31, 2022 and 2021

(11) Reconciliation of Financial Statements to Form 5500

The following is a reconciliation of participant contributions per the financial statements for the year ended December 31, 2021, to the Form 5500:

Year Ended December 31:	2021
Participant contributions per the financial statements	\$ 1,137,039
Add: Prior period participant contributions receivable	42,648
Participant contributions per the Form 5500	<u>\$ 1,179,687</u>

The following is a reconciliation of employer contributions per the financial statements for the year ended December 31, 2021, to the Form 5500:

Year Ended December 31:	2021
Employer contributions per the financial statements	\$ 1,035,140
Add: Prior period employer contributions receivable	33,914
Employer contributions per the Form 5500	<u>\$ 1,069,054</u>

SUPPLEMENTAL SCHEDULE

W. M. KECK OBSERVATORY 403(b) RETIREMENT PLAN

Plan Sponsor: W. M. Keck Observatory

Plan Sponsor EIN: 95-3972799

Plan Number: 001

Schedule H, Line 4i - Schedule of Assets (Held at End of Year)

December 31, 2022

Party in Interest (a)	Identity of Issue, Borrower, Lessor or Similar Party (b)	Description of Investment Including Maturity Date, Rate of Interest, Collateral, Par, or Maturity Value (c)	Cost (d)	Current Value (e)
	<i>Registered Investments:</i>			
*	CREF Stock R2	8,657 Units	a	\$ 5,537,085
*	CREF Growth R2	18,246 Units	a	4,969,842
*	CREF Social Choice R2	11,274 Units	a	3,315,318
	American Fds 2020 Tar Ret R6	256,087 Units	a	3,129,385
*	CREF Global Equities R2	13,189 Units	a	3,098,113
	American Fds 2025 Tar Ret R6	143,384 Units	a	1,939,979
	American Fds 2030 Tar Ret R6	131,733 Units	a	1,921,978
	Vanguard Ttl Stk Mkt Idx Adm	20,377 Units	a	1,897,138
	American Fds 2035 Tar Ret R6	115,059 Units	a	1,788,020
*	CREF Equity Index R2	5,109 Units	a	1,692,502
*	CREF Money Market R2	62,111 Units	a	1,670,245
*	TIAA-CREF Intl Eq Idx-Inst	75,172 Units	a	1,435,790
	American Fds 2045 Tar Ret R6	75,089 Units	a	1,224,704
*	CREF Core Bond R2	9,055 Units	a	1,115,288
	American Fds 2040 Tar Ret R6	63,199 Units	a	1,011,814
	American Fds 2050 Tar Ret R6	55,718 Units	a	887,580
	Vanguard Federal Money Mkt Inv	814,032 Units	a	814,032
*	TIAA Access Intl Equity T4	24,882 Units	a	774,021
	Vanguard Wellesley Income Adm	12,337 Units	a	730,837
	Vanguard US Growth Adm	6,781 Units	a	687,082
*	CREF Inflation-Linked Bond R2	7,811 Units	a	609,354
	VICTORY SYC ESTABLISH VALUE A	12,995 Units	a	580,897
*	TIAA-CREF Social Ch Eq-Inst	24,282 Units	a	540,527
	American Mutual Fund Class R6	11,041 Units	a	534,805
*	TIAA Access Lg-Cap Val T4	8,071 Units	a	467,024
	American Fds 2055 Tar Ret R6	23,368 Units	a	466,660
*	TIAA Access Lifecycle 2035 T4	8,777 Units	a	462,978
*	TIAA Access Mid-Cap Val T4	7,511 Units	a	444,873
	Cohen & Steers Real Est Sec Z	27,681 Units	a	419,925
	Eaton Vance Atl Cap SMID Cap A	13,607 Units	a	392,553
*	TIAA Access Real Est Secs T4	8,671 Units	a	381,176
	Metropolitan West Tot Ret Bd M	37,995 Units	a	343,858
	JPMorgan Small Cap Growth R6	18,897 Units	a	328,799
	VICTORY SYC SMALL COMP OPP A	6,783 Units	a	310,340
*	TIAA Access Quant Sml Cp Eq T4	4,187 Units	a	274,582
*	TIAA Access Sm-Cap Bl Idx T4	4,421 Units	a	273,346
	PIMCO Real Return Inst Class	26,954 Units	a	269,274
	American Fd New Perspective R6	5,523 Units	a	261,352
	Vanguard Ttl Bd Mkt Idx Adm	27,464 Units	a	260,357
	Janus Henderson Balanced I	6,704 Units	a	252,273

See accompanying independent auditors' report.

(Continued)

W. M. KECK OBSERVATORY 403(b) RETIREMENT PLAN

Plan Sponsor: W. M. Keck Observatory

Plan Sponsor EIN: 95-3972799

Plan Number: 001

Schedule H, Line 4i - Schedule of Assets (Held at End of Year) (Continued)

December 31, 2022

Party in Interest (a)	Identity of Issue, Borrower, Lessor or Similar Party (b)	Description of Investment Including Maturity Date, Rate of Interest, Collateral, Par, or Maturity Value (c)	Cost (d)	Current Value (e)
	American Small Cp World Fd R6	4,250 Units	a	\$ 247,451
	Oakmark Fund - Class R6	2,335 Units	a	238,754
*	TIAA Access Lifecycle 2020 T4	4,925 Units	a	234,908
	American Fds 2015 Tar Ret R6	13,399 Units	a	151,411
*	TIAA Access Equity Index T4	1,887 Units	a	149,669
	Oakmark International Fund R6	6,340 Units	a	145,574
*	TIAA Access Mid-Cap Gr T4	1,516 Units	a	101,203
	American Fds 2060 Tar Ret R6	6,639 Units	a	89,558
*	TIAA Access Social Ch Eq T4	1,088 Units	a	85,134
*	TIAA Access Core Bond Plus T4	2,268 Units	a	84,436
*	TIAA Access Lifecycle 2025 T4	1,631 Units	a	80,373
*	TIAA Access Core Bond T4	1,687 Units	a	62,012
*	TIAA Access Infl-Lnkd Bond T4	1,587 Units	a	59,187
*	TIAA Access Lifecycle 2045 T4	807 Units	a	44,363
*	TIAA Access Money Market T4	1,542 Units	a	39,699
*	TIAA Access Lifecycle 2050 T4	695 Units	a	37,999
*	TIAA Access Lg-Cap Gr T4	273 Units	a	26,021
*	TIAA Access Lifecycle 2030 T4	212 Units	a	10,734
*	TIAA Access Lifecycle 2040 T4	183 Units	a	10,121
*	TIAA Access Lifecycle 2010 T4	204 Units	a	9,347
	First Eagle Global Fund R3	149 Units	a	8,660
*	TIAA Access Growth & Income T4	72 Units	a	6,216
	American Funds 2065 Tar Ret R6	337 Units	a	4,395
	Oakmark Equity and Income R6	126 Units	a	3,702
				49,446,633
	<i>Fixed Annuity Contracts:</i>			
*	TIAA Traditional Annuity Contract	Non-Benefit Responsive	a	7,856,513
*	TIAA Traditional Annuity Contract	Benefit Responsive	a	2,108,865
	<i>Pooled Separate Account:</i>			
*	TIAA Real Estate	4,284 Units	a	2,385,972
**	Notes receivable from participants	Interest rates ranging from 4.25% to 7.25%, with maturity dates through September 2027	-	106,794
		Total investments		\$ 61,904,777
*	Represents a party-in-interest as defined by ERISA.			
**	A party-in-interest as defined by ERISA.			
a	The cost of participant-directed investments is not required to be disclosed.			

See accompanying independent auditors' report.

Schedule H, Line 4i
Schedule of Assets (Held At End of Year)

Name of Plan:

► W.M. Keck Observatory 403(b) Retirement Plan

Employer Identification Number: ►

95-3972799

For plan year (beginning/ending): ►

1/1/2022 to 12/31/2022

Plan number: ► 001

(a)	(b) Identity of issue, borrower, lessor, or similar party	(c) Description of investment including maturity date, rate of interest, collateral, par or maturity value	(d) Cost	(e) Current value
*	College Retirement Equities Fund variable annuities	TIAA Traditional Benefit Responsive		\$ 2,032,130.45
*	College Retirement Equities Fund variable annuities	TIAA Traditional Non Benefit Responsive		\$ 5,326,239.67
*	College Retirement Equities Fund variable annuities	TIAA Traditional Benefit Responsive 2		\$ 57,126.84
*	College Retirement Equities Fund variable annuities	TIAA Traditional Non Benefit Responsive 2		\$ 2,530,273.06
	College Retirement Equities Fund variable annuities	Plan Loan Default Fund		\$ 19,607.93
*	College Retirement Equities Fund variable annuities	CREF Stock R2		\$ 5,537,084.65
*	College Retirement Equities Fund variable annuities	CREF Money Market R2		\$ 1,670,244.82
*	College Retirement Equities Fund variable annuities	CREF Social Choice R2		\$ 3,315,318.15
*	College Retirement Equities Fund variable annuities	CREF Global Equities R2		\$ 3,098,112.54
*	College Retirement Equities Fund variable annuities	CREF Growth R2		\$ 4,969,841.87
*	College Retirement Equities Fund variable annuities	CREF Equity Index R2		\$ 1,692,501.82
*	College Retirement Equities Fund variable annuities	CREF Inflation-Linked Bond R2		\$ 609,353.55
*	College Retirement Equities Fund variable annuities	TIAA Real Estate		\$ 2,385,971.91
*	College Retirement Equities Fund variable annuities	TIAA Access Core Bond Plus T4		\$ 84,436.11
*	College Retirement Equities Fund variable annuities	TIAA Access Core Bond T4		\$ 62,012.41
*	College Retirement Equities Fund variable annuities	TIAA Access Equity Index T4		\$ 149,668.76
*	College Retirement Equities Fund variable annuities	TIAA Access Growth & Income T4		\$ 6,216.32
*	College Retirement Equities Fund variable annuities	TIAA Access Infl-Lnkd Bond T4		\$ 59,187.12
*	College Retirement Equities Fund variable annuities	TIAA Access Intl Equity T4		\$ 774,021.01
*	College Retirement Equities Fund variable annuities	TIAA Access Lg-Cap Gr T4		\$ 26,020.83
*	College Retirement Equities Fund variable annuities	TIAA Access Lg-Cap Val T4		\$ 467,023.54
*	College Retirement Equities Fund variable annuities	TIAA Access Lifecycle 2010 T4		\$ 9,347.52
*	College Retirement Equities Fund variable annuities	TIAA Access Lifecycle 2020 T4		\$ 234,907.92
*	College Retirement Equities Fund variable annuities	TIAA Access Lifecycle 2025 T4		\$ 80,372.79
*	College Retirement Equities Fund variable annuities	TIAA Access Lifecycle 2030 T4		\$ 10,733.68
*	College Retirement Equities Fund variable annuities	TIAA Access Lifecycle 2035 T4		\$ 462,978.20
*	College Retirement Equities Fund variable annuities	TIAA Access Lifecycle 2040 T4		\$ 10,121.38
*	College Retirement Equities Fund variable annuities	TIAA Access Lifecycle 2045 T4		\$ 44,362.60
*	College Retirement Equities Fund variable annuities	TIAA Access Lifecycle 2050 T4		\$ 37,999.27
*	College Retirement Equities Fund variable annuities	TIAA Access Mid-Cap Gr T4		\$ 101,203.24
*	College Retirement Equities Fund variable annuities	TIAA Access Mid-Cap Val T4		\$ 444,873.41
*	College Retirement Equities Fund variable annuities	TIAA Access Money Market T4		\$ 39,699.21
*	College Retirement Equities Fund variable annuities	TIAA Access Real Est Secs T4		\$ 381,176.51
*	College Retirement Equities Fund variable annuities	TIAA Access Sm-Cap Bl Idx T4		\$ 273,345.97
*	College Retirement Equities Fund variable annuities	TIAA Access Quant Sml Cp Eq T4		\$ 274,581.78
*	College Retirement Equities Fund variable annuities	TIAA Access Social Ch Eq T4		\$ 85,133.94
*	College Retirement Equities Fund variable annuities	CREF Core Bond R2		\$ 1,115,287.57
*	College Retirement Equities Fund variable annuities	TIAA-CREF Intl Eq Idx-Inst		\$ 1,435,789.81
*	College Retirement Equities Fund variable annuities	TIAA-CREF Social Ch Eq-Inst		\$ 540,527.39
	College Retirement Equities Fund variable annuities	American Fd New Perspective R6		\$ 261,351.86
	College Retirement Equities Fund variable annuities	American Small Cp World Fd R6		\$ 247,450.61
	College Retirement Equities Fund variable annuities	Metropolitan West Tot Ret Bd M		\$ 343,857.78
	College Retirement Equities Fund variable annuities	PIMCO Real Return Inst Class		\$ 269,273.76
	College Retirement Equities Fund variable annuities	Vanguard Federal Money Mkt Inv		\$ 814,032.06
	College Retirement Equities Fund variable annuities	Vanguard Ttl Bd Mkt Idx Adm		\$ 260,357.12
	College Retirement Equities Fund variable annuities	VICTORY SYC SMALL COMP OPP A		\$ 310,339.58
	College Retirement Equities Fund variable annuities	Eaton Vance Atl Cap SMID Cap A		\$ 392,553.39
	College Retirement Equities Fund variable annuities	Vanguard Wellesley Income Adm		\$ 730,836.54
	College Retirement Equities Fund variable annuities	American Fds 2015 Tar Ret R6		\$ 151,411.03
	College Retirement Equities Fund variable annuities	American Fds 2020 Tar Ret R6		\$ 3,129,384.93
	College Retirement Equities Fund variable annuities	American Fds 2025 Tar Ret R6		\$ 1,939,979.51
	College Retirement Equities Fund variable annuities	American Fds 2030 Tar Ret R6		\$ 1,921,978.24
	College Retirement Equities Fund variable annuities	American Fds 2035 Tar Ret R6		\$ 1,788,019.79
	College Retirement Equities Fund variable annuities	American Fds 2040 Tar Ret R6		\$ 1,011,814.37
	College Retirement Equities Fund variable annuities	American Fds 2045 Tar Ret R6		\$ 1,224,704.22
	College Retirement Equities Fund variable annuities	American Fds 2050 Tar Ret R6		\$ 887,579.90
	College Retirement Equities Fund variable annuities	American Fds 2055 Tar Ret R6		\$ 466,659.93
	College Retirement Equities Fund variable annuities	American Fds 2060 Tar Ret R6		\$ 89,558.14
	College Retirement Equities Fund variable annuities	American Funds 2065 Tar Ret R6		\$ 4,395.51
	College Retirement Equities Fund variable annuities	American Mutual Fund Class R6		\$ 534,804.67
	College Retirement Equities Fund variable annuities	Cohen & Steers Real Est Sec Z		\$ 419,925.22
	College Retirement Equities Fund variable annuities	JPMorgan Small Cap Growth R6		\$ 328,799.37
	College Retirement Equities Fund variable annuities	Oakmark Equity and Income R6		\$ 3,701.93
	College Retirement Equities Fund variable annuities	Oakmark International Fund R6		\$ 145,574.03
	College Retirement Equities Fund variable annuities	Oakmark Fund - Class R6		\$ 238,754.50
	College Retirement Equities Fund variable annuities	Vanguard Ttl Stk Mkt Idx Adm		\$ 1,897,137.93
	College Retirement Equities Fund variable annuities	Vanguard US Growth Adm		\$ 687,081.91
	College Retirement Equities Fund variable annuities	First Eagle Global Fund R3		\$ 8,660.12
	College Retirement Equities Fund variable annuities	Janus Henderson Balanced I		\$ 252,272.58
	College Retirement Equities Fund variable annuities	VICTORY SYC ESTABLISH VALUE A		\$ 580,897.18
	College Retirement Equities Fund variable annuities	Participant Loan Fund		\$ 106,794.30
	Grand Total			\$ 61,904,777