Okayama Prefectural **Tsuyama High School**

SSH Project

Okinawa Science Camp

(12th Annual U.S.A. Science Camp)

令和６年度 岡山県立津山高等学校 SSH 沖縄研修 報告書

研修の概要

本研修（SSH 海外研修）では、従来はアメリカのカリフォルニア、ボストン、ワシントンD.C.を訪問し、ハーバード大学、マサチューセッツ工科大学、NASA、スミソニアン博物館などで研修を行っていたが、新型コロナウィルス感染流行期以降は、オンラインによる研修が続いていた。本年は当初アメリカへの訪問再開を計画したが、渡航費用の高騰のため断念し、代替として国内の研究施設で英語による研修を実施することとした。

１．目　的　外国人研究者の所属する研究施設で外国語による研修を行うことで，自然科学研究に対する意欲を高めると同時に国際的な研究について学ぶことで視野の拡大を目指す。また，亜熱帯地域の自然環境を観察できる施設を訪問し，動植物の多様性について調査を行うことで，科学的調査の手法について学ぶ。

２．内　容　① 琉球大学理学部訪問：理学部海洋自然科学科を訪問し講義・研究紹介・交流を行う。

研修Ⅰ：James Davis Reimer 先生による研究紹介（海洋生物学）・留学生との交流・研究施設見学

② 沖縄科学技術大学院大学訪問：研究者による講義・研究紹介・また本校課題研究を用いたポスターセッションを行う。

研修Ⅱ：Esteban Gabriel FREGOSO FERNANDEZ 先生による研究紹介（分子神経科学）・研究施設見学

研修Ⅲ：Shin Sun 先生によるキャリア・トーク

研修Ⅳ：本校課題研究内容のポスターセッション

研修Ⅴ：Shin Sun 先生による研究紹介（ネットワーク型量子デバイス）

③ 東村ふれあいヒルギ公園を訪問し，カヌーを用いて亜熱帯地域の自然環境に関する調査を行う。

研修Ⅵ：亜熱帯動植物についての調査

３．期　日　令和 7 年 3 月 11 日(火)～14 日(金)

４．場　所　① 琉球大学理学部 / 沖縄県中頭郡西原町字千原 1 番地

② 沖縄科学技術大学院大学（OIST） / 沖縄県国頭郡恩納村字谷茶 1919-1

③ 東村ふれあいヒルギ公園 / 沖縄県国頭郡東村字慶佐次 54-1

５．宿泊場所　令和７年３月 11 日（火）～13 日（木）　計３泊

ザ・ムーンビーチリゾートミュージアムリゾート

沖縄県国頭郡恩納村字前兼久 1203　℡ 098-965-1020

６．参加生徒　２年次生　15名

普通科：照井 芳偲、福田 莉子、山本 大夢、小笹 楓子、藤井 咲衣

實平 桃奈、牧田 花梨、岸本 望来、下山 遥、南 百音、

時山 真帆

理数科：安藤 優和、野田 健太、濵田 佳槻、水野　悠有

７．引率教員　２名

二宮　健一（英語科）　　岡田　悠希（数学科）

8. 事前学習，事後学習

事前学習：英会話，訪問先の事前調査等。９月下旬から週１回程度（金曜日放課後）
うち，月１回程度は GSO（江原 Martina 先生ら４名）による英会話。

事後学習：報告レポートの作成（海外研修報告冊子の作成）および令和７年度 SSH 成果報告会での発表

令和６年度　沖縄研修　実施報告

二宮　健一

本年は、当初アメリカにおける実地研修の復活を計画したが、渡航費高騰のため断念し、琉球大学理学部海洋自然科学科ジェイムス・ライマー教授の研究室訪問、沖縄科学技術大学院大学（OIST）訪問、東村ふれあいヒルギ公園での自然観察を中心とした研修に切り換えた。

１．事前研修／グローバル・サイエンス・おかやま（GSO）

例年、3 月に実施されるアメリカでの実地研修の準備として、1 年間を通して事前研修と英会話練習（GSO）を行っている。本年は、研修内容の変更・調整に時間がかかったため、2 学期からの準備開始となった。（1 学期のあいだは、沖縄研修とは別途に参加生徒を募集して GSO を行った。）

＜実施日時＞

GSO：　9 月 13 日、10 月 4 日、10 月 25 日、11 月 8 日、11 月 22 日、12 月 20 日、1 月 24 日、1 月 31 日、2 月 14 日

事前研修：　9 月 20 日、10 月 18 日、11 月 1 日、11 月 15 日、12 月 13 日、1 月 17 日、2 月 7 日

事前研修では、主にライマー教授や OIST の研究者が出演する YouTube のビデオを使ってディクテーション（聞き取り）とディスカッションの練習を行った。GSO では、4 名のネイティブ講師による英会話練習が中心だが、最終回は英語によるポスター発表の練習を行った。生徒のレポートからは、GSO でのネイティブ講師の先生とのやりとりを通して、英語の技術にこだわらず、積極的にコミュニケーションに臨む姿勢の大切さを学んだ様子が読み取れる。

私は英語が好きですが、実際の状況で英語を使う時には、英語で話すのが難しく、思うように言いたいことが言えませんでした。しかし、私自身がよく理解している語彙を使うことで、簡単に表現して伝えることを学びました。そして、今は事前研修や GSO を通して英語の技術が向上したことに自信を持っています。（普通科自然コース生徒のレポートより）

GSO では、多くの先生から色々な国のお話を聞くことで異文化についての視野を広げることができました。イギリスやオーストリア出身の先生から、ご自身が学生だった頃のお話を聞くと、日本の教

育とは大きく違い、特に興味深かったです。また、ある先生が、「他人と自分を比べるのではなく、昨日の自分と今日の自分を比べなさい。少しでも成長しているのなら、それは大きな一歩です。」と語ってくださったのが特に心に残っています。この言葉は、私がこの先、自分を他の人と比べて落ち込みそうになった時に、救いになると思います。（普通科自然コース生徒のレポートより）

始めは先生方が話していることを理解するのが難しかったです。いつも学習している英語は明瞭かつ自然で、理解するのが容易ですが、対面で話していると、特有の方言のような表現を使い、とても速く話されます。しかし、少しずつそれに慣れて、その人が言おうとしていることを推測し、すぐに反応できるようになりました。（普通科人文コース生徒のレポートより）





２．研修１日目

琉球大学のライマー教授の研究室では、教授と 4 名の留学生が出迎えてくれた。まずは、ライマー教授の講義を受け、沖縄の自然環境の特異性や、自然保護と開発のジレンマ、生物多様性の重要性について学んだ。

さらに、教授と留学生の皆さんが早朝に近隣の海に潜って採取してきてくださった、サンゴの破片を顕微鏡で観察し、多毛類や甲殻類の幼生、ヒトデの幼生など、驚くほど多様な生物がそこに生息していることを知ることができた。観察後は、全てのサンゴ破片をバケツに回収するよう指示され、この後海に戻しに行くのだと語られており、研究目的であっても生命を犠牲にせず、自然を尊重する精神を示されていた。

最後に、留学生の一人であるフェビアン氏の講義を受け、採取した海水に含まれる DNA から生息生物を特定する「環境 DNA 解析」の手法について学んだ。

ライマー教授の講義で、沖縄のサンゴ礁を保護することは多様性、希少性、種の特異性、そしてそれらが脅かされていることを考慮するととても重要であることを学びました。そして、サンゴの破片を観察し、カニ、ヒトデ、その他多様な生き物を見つけました。ライマー教授の研究室の方々が海に行ってサンゴの破片を採取してきてくれたそうです。これは海が豊かな沖縄で研究を行う利点の一つだと思いました。ライマー教授の講演の後で、ホテルの近くの浜辺に行くと、サンゴが打ち上げられているのを発見し、本土とは異なる生態系がここにあることを感じることができました。（理数科生徒のレポートより）

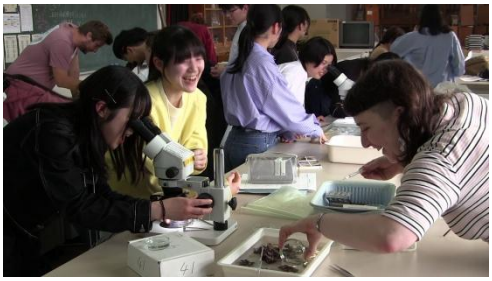
海洋生物の保護のためにはサンゴ礁が重要であることが分かりました。ライマー教授の講義によると、沖縄の海には、最も多様な希少生物が生息しているとのことです。サンゴ礁はそれらの生物の住処となり、海岸では防波堤の役割をします。しかし、人間の活動による赤土の流出や、海岸開発などがサンゴ礁に悪影響を及ぼしています。これは沖縄の問題で、私たちには関係ないと考える人もいますが、同様のことは他の場でも起こっており、他人事ではないものとして環境について考えなければいけないと思いました。（理数科生徒のレポートより）

初日に、琉球大学を訪問し、ライマー教授の講義を受けました。沖縄は、森林地域、観光地域、工業地域に区分され、異なる海岸開発が行われていることを知りました。（中略）サンゴの白色化の主な原因は海水温の上昇であり、これは海岸に置かれるテトラポッドと関係しています。テトラポッドが海流を変え、水温と水質を変えてしまい、サンゴの白色化につながります。台風が海水温を下げ、白色化を防ぐ働きをすることにも驚きました。（中略）顕微鏡を使わなくても、DNA を分析して生体を特定できることを知り、この先進的な技術に驚きました。（普通科人文コース生徒のレポートより）

最も印象に残った経験は、事前研修では画面でしか見たことがなかったライマー教授の講義を受けたことです。実際に先生とお会いしてみると、人を惹きつけるような存在感に感銘を受けました。お話の間もアイコンタクトを取り続け、温かく歓迎する雰囲気を作ってくださいました。（普通科人文コース生徒のレポートより）








琉球大学での研修を終え、宿舎への移動の途中に、世界文化遺産に登録されている座喜味城跡を見学した。曲線が美しいこの地域特有の石垣の形状を観察するとともに、高台から沖縄市、読谷村の周辺を一望して沖縄本島の地形を確認することができた。

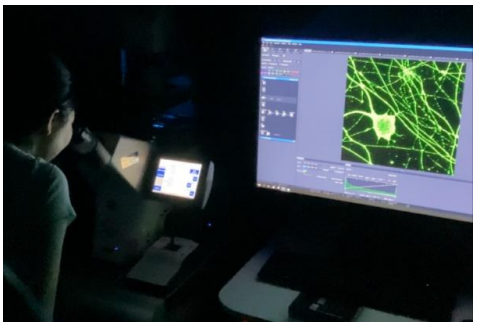
また、この日は那覇空港に到着し、琉球大学へと向かう途上で琉球そばの名店に立ち寄り、昼食をいただいた。具材の「ソーキ」（豚のスペアリブ）や副菜の沖縄産もずく、調味料「こーれーぐーす（高麗胡椒）」などを通して、沖縄の食文化の一端を学ぶことができた。


３．研修２日目

2 日目は沖縄科学技術大学院大学（OIST）を訪問した。沖縄の振興を視野に入れた世界最高水準の研究教育を目指す施設として、内閣府の管轄のもと 2012 年に開学した OIST は、教員の 6 割、学生の 8 割が外国人という国際的な研究環境を実現している。生徒たちは外国出身の研究者たちがカフェテリアで英語で議論する様子や、近未来的な建築様式、学際的な研究環境に感銘を受けたようであった。

OIST の学生は授業料を全く支払わなくてもよいということに驚きました。また、OIST には学部学科もなく、学生たちはより柔軟で活動的な研究ができます。OIST にはホワイトボードがいたるところにありました。学生たちは窓ガラスにでも思いついたことを書き留めておき、そうして考えを整理するのだそうです。私もメモ帳に自分の考えをメモしたいと思いました。（普通科人文コース生徒のレポートより）

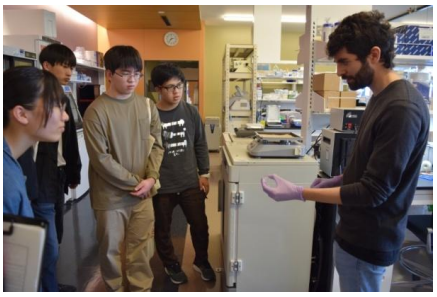
近未来的な建築と、世界中から研究者が集まっている様子に驚きました。（中略）OIST の建物は周囲の景観に調和するよう曲線が多く、自然の色が使われています。これは生物多様性を保全するための恩納村からの要求に応えたもので、科学的進歩と環境保護のバランスをとったものということを知り、素晴らしいと思いました。（普通科人文コース生徒のレポートより）

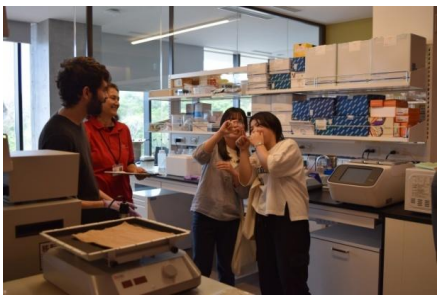



OIST でははじめに分子神経科学ユニットに所属するエステバンさんによるキャリアトークと研究紹介を受けた。医師として数か国で仕事をした後、事故にあった患者の神経の復元の技術を高めるため、研究者としての道を選んだエステバンさんのお話から、医療系志望の生徒はたいへん刺激をうけたようであった。

私は特に、神経科学を研究されているエステバンさんに感銘を受けました。彼は母国メキシコで医師免許を取得し、インターンシップ、ボランティア、そして様々な国で救急医療に従事した後で沖縄に来られていました。私も医師免許を持つ研究者になりたいと考えているので、彼の経歴や研究はとても参考になりました。（理数科生徒のレポートより）

OIST の学生であるエステバンさんによる軸索損傷についての講義では、神経の培養方法や、軸索損傷の実験手順、そして軸索を引き延ばすと、その後の再生期間に続き衰退期間があることを教えてもらいました。その後、研究室訪問の時には、なぜ彼の実験装置では軸索を斜めに引き延ばすのかを質問することができました。（中略）講義の全てを理解するのは難しかったけれど、質問をするという目的も達成でき、非常に充実した学習経験でした。（普通科人文コース生徒のレポートより）





さらに、台湾大学を卒業し、OIST のネットワーク型量子デバイスユニットで研究をされているシンさんのキャリアトークをお聞きした。高校生の時代は物理が苦手だったが、現在はその魅力を知り研究の最前線を走られているというシンさんのお話は、生徒の進路選択の参考になったようであった。

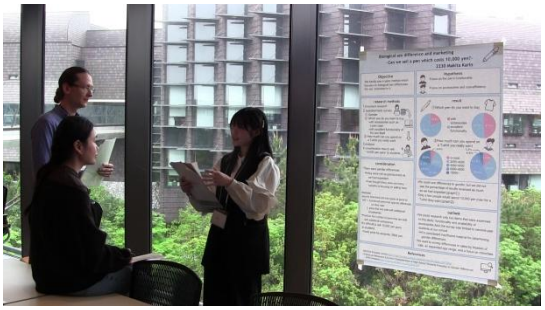
４．研修３日目

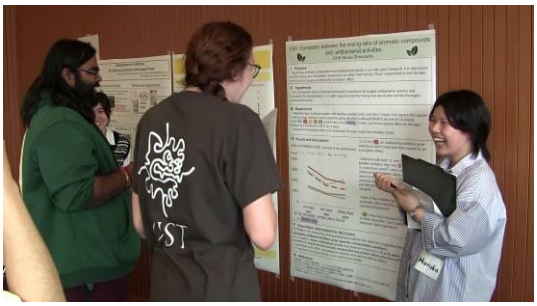
この日も OIST を訪問し、午前は本校生徒によるポスター発表を行った。普通科生徒は 2 年次 iP（十六夜プロジェクト）で行ったグループ研究の発表、理数科生徒は課題研究の発表を英語にして準備したものである。OIST からは博士課程の学生 8 名がコメンテイターとしてついてくださり、各生徒の発表に対して大変熱心に質問やコメントを与えてくださった。生徒たちは、質疑応答にも果敢に応じており、世界最高水準の研究に従事する研究者たちと学術的な交流ができたことが大いに自信になったようである。

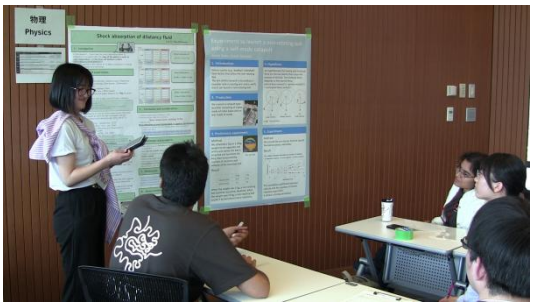
科学的な知識に加えて、より効果的に考えを伝える方法も学ぶことができました。研究を発表して専門家からフィードバックをもらうことで、考えを論理的に整理しそれを明瞭に表現する方法を学ぶことができました。この技術は将来の研究や専門的探究においてとても貴重なものになると思います。（理数科生徒のレポートより）

OIST で行った発表では、原稿を使わずに研究の発表をし、OIST の学生たちの質問に答え、専門的に研究を行っている人からしか得られないような高度な視点からの貴重なフィードバックを得ることができました。日本語話者ではない人とも会話ができるという自信を得られたことは大きな達成でした。（普通科自然コース生徒のレポートより）

ポスター発表の原稿の準備では、私の研究内容を伝える効果的な表現を追求し、表現の幅を広げることができました。このような充実した活動を経て、上手くプレゼンを行うことができ、自分の考えをなんとか英語で伝えるだけでなく、OIST の学生との質疑応答も行うことができました。琉球大学の学生や OIST の学生はとてもやさしく、私たちは皆人間なのでジェスチャーなども使って一生懸命コミュニケーションをとろうとすれば理解してもらいやすくなるということがわかった。（普通科人文コース生徒のレポートより）



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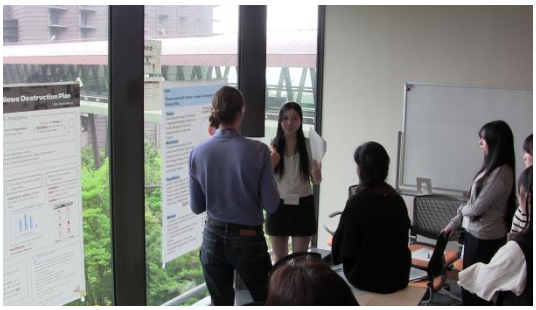
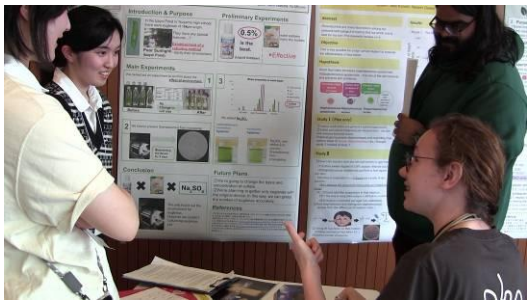
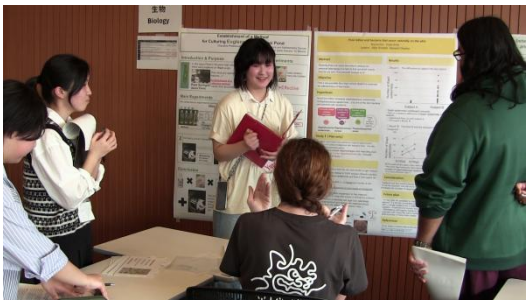



Introduction & Purpose
Preliminary Experiments
Main Experiments
Conclusion
Future Plans
References


生物
Biology

午後は、前日にキャリアトークをお聞きしたシンさんによる量子暗号学の講義を受けた。高校の物理では学ばない量子力学に基づく講義内容は、生徒たちにとっては大変難解なものだったが、生徒たちは質問をしたり、互いに教え合ったりしながら、むしろその難解さを楽しんでいるようであった。

私はシンさんによる量子コンピューターの暗号理論と情報セキュリティについての講義に最も感銘を受け、関心を持ちました。シンさんは偏光板を使って説明しくださり、またいつでも質問を受けてくださったので、彼の講義は理解しやすかったです。彼の講義によれば、量子は重ね合わせ（superposition）の状態で存在しており、例えば、誰かが友人に量子ネットワークでメールを送った場合、第三者がその情報を覗くと量子の形を変えてしまうことになるため、盗聴を防ぐことができるとのことでした。量子の働きは私たちが知っている物理では表すことができず、この講義はとても面白いと感じました。また彼の講義の後、OIST のスーパーコンピュータを見せてもらい、考えていたよりも大きく強力であることに驚きました。研究室もとても活動的で、大学の雰囲気を感じられたことは素晴らしい経験でした。（理数科生徒のレポートより）

私ははじめ量子暗号論について何も知らなかったので、前日にリサーチをして基礎的知識を得て講義に臨みました。それでも難しい英語の専門用語には苦労しましたが、図や明瞭な説明のおかげで、内容の半分以上は理解できました。（中略） はじめて周囲の生徒に私の考えを説明することもでき、大きな自信につながりました。講義は情報の盗聴を防ぐための偏光子を用いた量子暗号化、そして基底と鍵を使って情報をやり取りすることについてのもので、特に専門的でした。（普通科人文コース生徒のレポートより）




５．研修最終日

最終日は、熱帯雨林が広がる沖縄本島北部「やんばる」地域の東村ふれあいヒルギ公園を訪問し、自然観察を行った。カヌーに乗ってマングローブ林の生態系を観察する予定であったが、この日の研修は干潮の時間帯であったためマングローブ林では実施できず、海上に場所を変更してカヌー体験を行った。また、突如の雷雨に見舞われ、マングローブ林の遊歩道を歩いての自然観察も実施できなくなり、近隣の「東村立山と水の生活博物館」での研修に変更となった。博物館では、やんばるの森を再現したジオラマ、剥製や生体の展示、生活民具や農業・林業の歴史についての展示などを通して、沖縄の自然や民俗について理解を深めることができた。




６．おわりに

今回の研修には、普通科人文コースの生徒が７名、理数科と普通科自然コースの生徒が８名参加した。担当教員としては、文系生徒の語学力と理系生徒の科学知識が相乗効果を生むような活動を行ってほしいと願っていたが、研修の随所で互いに教え合う様子が見られ、とても嬉しかった。生徒の感想からは、研修を通して英語運用能力に自信がついたのはもちろんのこと、お世話になった研究者の方々の熱意に感化され、自分の将来を改めて思い描く機会となったことがうかがえる。

私はずっと神経科学は高度に専門的な分野だと思っていましたが、他の多くの領域と関連していることを知り驚き、あまり一つの分野にばかりこだわるのではなく、様々な分野を学ぶことが大切だと気づきました。（中略） この研修に参加するまでは、質問をしたり議論で意見を述べたりすることをしばしばためらっていましたが、好奇心を持つことが促される環境に身を置くことで、このためらいを克服することができました。質問をするということは無知であることを意味するものではなく、より多く学びたいという意欲を表すものだと気づきました。（中略） 最大の気づきの一つは、思っていたよりも科学的実験が面白いものだということです。実験し、データを分析し、結果について議論することで興奮と達成感を感じました。研究や問題解決をし続けることができる将来を追求したいと思うようになりました。（理数科生徒のレポートより）

この研修を通して様々なことに好奇心を持つことの大切さを学びました。行動を起こさなければ、何も得られないということも学びました。以前は化学にはあまり関心がなかったのですが、学べば学ぶほど面白くなりました。英語で全ての講義を受けたことも私の意欲を増しました。すべてが新しく貴重な経験で、それらを大いに楽しみました。この経験を通して、世の中の不便なことを改善したいという強い思いを持つようになり、また、自分の可能性を広げることができるということに気づき、それが自信につながりました。（普通科人文コース生徒のレポートより）

研究者の研究に対する情熱的な姿勢は私が将来目指す姿となりました。こんな素晴らしい同僚たちとともに働きたいと思いました。この経験を通して、“Vision”と“Research Mind” を伸ばすことができました。（普通科自然コース生徒のレポートより）

この 4 日間の沖縄研修を通して、分からないことを全力で理解しようとし、できなかったことを達成しようとする積極的な姿勢を身につけることができました。英語はとても苦手で、沖縄研修の間もその気持ちはなくなりませんでしたし、他の人と比べて劣っていると感じることも多くありました。昔の私なら「どうせわからないから」とあきらめてしまっていたでしょうが、わからないことも理解しようと努力する仲間たちや、琉球大学の学生さん、OIST のスタッフの皆さんの姿勢に刺激され、私も最大限に理解しようと努め、知らず知らずのうちにわからないことを調べたり質問したりしていました。努力をすることで、以前はとても困難に思えたことでも克服し、その過程を楽しむことができると気づいたことは、この研修を通して得られた知識よりもっと価値があることだと感じています。（普通科人文コース生徒のレポートより）

最後に、この研修の実現にご尽力くださった SSH 推進室長の津田拓郎先生、SSH 事務員の大久保博子さん、沖縄の文化に精通し、後輩たちに豊富な知識をご教授くださった光トラベルの光嶋さんにお礼を申し上げたい。訪問先スタッフの方々、GSO の先生がた、本校の先生がたのご協力と熱意、そして生徒の Vision, Grit, Research Mind によって達成された初回沖縄研修の実績を土台として、今後もさらに充実した研修が実施されることを願う。

What I learned in Okinawa

Kenta NODA

I joined the GSO Program for the Okinawa Science Camp. This Program is not about learning English, but about communicating with instructors and learning various ways of thinking from them in English. It was difficult to say what I wanted to say in English, but this program was a valuable opportunity to speak it in real time. And the fact that I was able to say what I wanted to say gave me confidence in my English. The more confident I became in my English, the more I began to speak it, and the more I grew.

In addition to GSO, I had a pre-training for the Okinawa Science Camp. I learned about the lecture topics in advance so that the lectures I would attend in Okinawa would be meaningful. This pre-training made me more confident.

When I arrived in Okinawa and got off the plane I felt a warm wind. The climate of Okinawa, which is quite different from that of Tsuyama, made me realize that I arrived in Okinawa.

On the first day, I went to The University of the Ryukyus to learn about coral reefs from Prof. Reimer. I learned that protecting Okinawa's coral reefs is a high priority in terms of diversity, rarity, and uniqueness of species and the fact that they are threatened. We then observed the coral rubble and were able to find crabs, starfish, and various other creatures. I heard that members of Prof. Reimer's lab went to the ocean to retrieve coral debris. I felt this is one of the advantages of conducting research in Okinawa, where the ocean is rich. As for the ocean, when I went to a beach near the hotel after Prof. Reimer's lecture, I found coral washed up on the beach and realized that the ecosystem of the ocean is different from that of mainland Japan.

On the second and third day, I went to Okinawa Institute of Science and Technology (OIST). OIST has many foreign students, and the people who gave us lectures were also foreigners, and I was impressed by their knowledge of Japanese culture, such as Doraemon and Gundam.

Mr. Esteban, who worked as a doctor in Mexico and came to OIST to study neuro-regeneration, told me that he learned many things through various activities, including volunteering. The story about his experiences as a doctor motivating his research was very interesting. The topic of axonal regeneration and axonal degeneration was also very interesting, and I thought it was amazing how the equipment reproduced actual nerve injuries.

I was also given a lecture about quantum cryptography by Mr. Sun. It was very difficult, but I managed to understand it because he taught me the basics in order. It also helped me to have an image of physics beyond high school physics. I asked many questions in his lectures, which helped me understand and gave me more confidence in my English.

On the last day, I paddled a canoe in the ocean. Since I had been attending lectures for three days, this was the first time I was able to experience the nature of Okinawa. It rained, but we were able to enjoy it with the idea that it was also an Okinawan specialty. Finally, I bought some souvenirs for my family and friends on Kokusaidori street.

Through Okinawa Science Camp and GSO, I learned that if I try, I can do better than expected. There is a Japanese phrase, “Annzuru yori Umu ga Yasushi,” and I was able to realize this. This program gave me a little more confidence in myself, and I would like to try more things. Thank you to the teachers for giving me this opportunity.

Report on Okinawa Science Camp and GSO

Fuko KOZASA

There are two things I think I have improved on through the Okinawa Science Camp and GSO. First, my confidence in English has increased. I was not originally good at speaking English. When I communicated my opinion in English in class, I was afraid my grammar or words were wrong and was sometimes depressed about class. Even so, I didn't undertake special efforts and thought that I would remain poor at speaking English in the future. However, news of this program made me try to join it as a good opportunity to improve my English. The following activities were effective in raising my awareness of English. In GSO, I developed practical English skills through conversation with foreign teachers. From this, I was able to become accustomed to English through listening native English and explaining something. In the preparation of my poster presentation drafts, I was also able to pursue effective expressions to convey my research content and broaden the range of expression. After these fulfilling previous activities, I made a successful presentation. I managed to convey my thoughts in English not only in my presentation but also in the Q&A session with the OIST students. The Ryukyu university students and the OIST students were kind, but I realized that we are all human beings, and if I tried my best to communicate with them, including gestures, I would be able to help them understand. The activities in the training program have contributed to my confidence and enthusiasm in speaking English.

Second, my enthusiasm for learning has increased. Even before my participation, I found my regular classes interesting and had an interest in the university's academics. This was further enhanced as I learned more about the studies in which the professors and lecturers specialize through the previous activities. Then, by actually taking the lectures and experiences, I felt the professors' enthusiasm and exploration for academics. I felt these in their brief explanations that helped us, the students, to understand, in their words that conveyed the excitement of learning, and in their detailed responses to our questions. Although the academics I studied this time were in the sciences, and in response to my enthusiasm, I became very interested in the academics. At the same time, I hoped that the university would allow me to study the academics I was interested in, and like this training

program, I wanted to learn a wide range of academics regardless of my field of specialization.

From the program I learned that people who pursue academic studies are paying attention to the world. I listened to the lectures by Prof. Reimer, Mr. Esteban, and Mr. Shin. All three people are pursuing their own interests. However, they didn't just satisfy their own curiosity. They used their interests to contribute to society through technological innovation and environmental protection. Prof. Reimer is working hard to protect the marine environment, the Higashimura Hureai Hirugi park staff members are working to protect the ecosystem of Okinawa, Mr. Esteban is working to solve the mysteries of the nervous system and cure nervous system diseases, and Mr. Shin is working to invent advanced computers and make the Internet more secure. I noticed that might be what Prof. Reimer meant when he said, “Think globally and act locally,” when I asked him a question. I also want to be someone who has a broad perspective and aims to solve society's problems.

My future challenges include more questioning. I tried to understand what our instructors taught me this time, but I was almost unable to question it from a new perspective. In the future, I want to be proactive in asking questions that are not difficult but necessary for understanding.

This training was very meaningful in broadening my various perspectives. In addition to the lecturers, I would like to thank all the teachers who planned the program and all the students who participated with me.

Reflection of Okinawa Science Camp

Momone MINAMI

Okinawa Science Camp, which includes GSO and preparations, enabled me to grow up in many aspects.

First of all, when it comes to my progress, I could definitely improve my English skills. English conversation at GSO, and learning with the goal of Okinawa Science Camp made me motivated to study English. Above all, I am now able to communicate my thoughts in English to the extent that I can use English as a means of communication.

In the presentation I gave at OIST, I was able to present my research without a manuscript, answer questions from students at OIST and receive lots of valuable feedback from sophisticated perspectives which I could only get from people who do research as a profession. It is a great achievement that I have gained the confidence to talk with people whose native language is not Japanese.

Of course I have learned many things at lectures at OIST and the University of the Ryukyus , however, I was especially fascinated by the wonderful learning environment at OIST as my interest in the field of education. No matter how hard you work to enter OIST, there is more appeal beyond that; They offer free tuition, have building designs that successfully balance research and learning, feature a complicated layout of each unit room which aims for promotion of interaction between students and gaining various perspectives regardless of their major. There are common spaces for students to communicate with each other, and learning support is provided for students whose native language is not English or Japanese (one guide said, "No worry of language!", which left a deep impression on me). Also, consideration of the environment is very good.

And it was also impressive for me to be exposed to aspects of research in unfamiliar fields such as neuroscience and quantum computers. The contents of the lectures were so difficult that we needed huge efforts to understand. However, the process of trying to understand with discussion, teaching with my friends, and explanations from teachers was new to me

and I felt that learning was enjoyable. The laboratory visits and hands-on sessions were interesting because there was a lot of research equipment that I saw for the first time.

I participated in GSO through 1~2 semesters. Through GSO, I could broaden my view of different cultures as I heard about a lot of interesting stories of diverse countries from many teachers. It was particularly interesting to hear the stories of teachers from the UK and Austria when they were students, which were very different from the Japanese school system. And one teacher's words at the last GSO were especially moving. 'Don't compare yourself to others, compare yourself to yesterday. If you have grown even a little, that's a big step' (includes a little of my own interpretation). I think these words will save me in the future when I am likely to compare myself with someone else and feel depressed.

During the year of Okinawa Science Camp activities, I was often faced with many worries about myself and my future path as a high school sophomore, but I was often encouraged by my friends who worked hard together toward one goal, and I was able to overcome many obstacles. Also, it had a lot of influence on me. For instance, since I had always been interested in studying abroad, I was able to spend a few days in a place where various cultures coexisted, and the feeling of the wide world I had never known increased my interest and desire to study abroad even more.

Lastly, I express my special thanks to the support of many people, teachers, students at Okinawa, guides, and my friends who helped me and my friends learn and experience a lot.

My Wonderful Days in Okinawa

Yuwa ANDO

We went to Okinawa for training from March 11 to 14. I learned a lot of things. Let's introduce them.

On the first day, we visited Okinawa University and learned about sea animals. There are a variety of sea animals in Okinawa. Some of these cannot exist without the coral reefs. They play a role in preserving the sea habitat. I was surprised that almost all coasts of Okinawa are artificial reefs. I thought typhoons caused terrible damage, but they actually make a good environment for sea animals by stirring the sea water. I cannot forget the taste of mozuku at Tyode-gua. It was very delicious. We went to a night beach after dinner. It was so beautiful and the sand felt good to the touch.

We went to OIST(Okinawa Institute of Science and Technology) from March 12 to 13. We listened to Esteban's experiment on March 12. It is important to explore the field of study. A lot of knowledge can help you with something happening. I could see cytoplasmic streaming. I was able to concentrate on listening while also utilizing the knowledge I had learned in high school biology. We looked around the campus in the afternoon. There were a lot of trees in OIST.I like biology, so it made me very excited. He explained the instruments related to his research in the morning and we observed neurons using a microscope. It was so amazing.

Following day, we showed our presentation to PHD students. I have introduced my presentation at an academic meeting in Japanese. However, I haven't shown my presentation to the audience in English. I was so nervous and excited. However, when it came time to present, it was surprisingly enjoyable to do so. I managed to listen to English and return questions. I was able to get a lot of knowledge, but I couldn't say what I really wanted to. I was very frustrated. So, I have made up my mind to study English. After that, we listened to Shin san's experiment. It was too difficult for me to understand, but we talked about it with each other. It was a good activity to learn deeply. That day's dinner

was last, so we had a lot of food, such as ice cream, curry rice and so on. I thought our bond was stronger than before.

The purple yam pancake was very delicious on that day's breakfast. I was surprised that Okada sensei ate two pancakes. Also, I realized Okada sensei had a sweet tooth. We went to a river to canoe. I haven't done canoeing. I was very scared. It was easy to paddle from the river out to the ocean, but once out to sea, the waves became so fierce that it was no longer easy to paddle. Eventually, our canoe ran aground. Now, that was a good experience. We were in the middle of canoeing when it started raining heavily. We were going to look at mangroves, however we could not do it. So we went to a local museum instead. There were habu vipers. I wanted to see it and I was excited. Also, we learned about Yanbaru. I wanted to know more about the Yanbaru region. The lunch we had on the bus was exceptionally tasty, partly because we were tired from canoeing. I will never forget the taste of the Blue Seal ice cream I had at the service area. After that, we went to Okinawa International Street. We had only two hours, but we could eat acai ball and buy souvenir. I was surprised to see many perfume stores in Okinawa. I wonder if this has something to do with its history.

Through this training program, I could get a good experience not only from OIST but also from friends. By familiarizing yourself with English, you can speak with people from many countries and gain a lot of knowledge. Moreover, I want to study OIST in the future. This training helped me find my weaknesses and also my strengths.

Finally, I would like to thank Ninomiya sensei and the outside instructors who taught English in conducting this training.

How the Okinawa Science Camp Broadened My Horizons

Haruka　SHIMOYAMA

I had a wonderful time in this program: Okinawa science camp! So I will introduce what I learned in Okinawa and how my outlook on the future has changed.

I underwent many things which gave me different perspectives, but I was most impressed by the lecturers' lesson for career opportunities in the future.　One of them is to think about which ability we should improve and decide what steps we should take towards our ultimate goal. The lecturer went to an overseas internship program to develop his English skill but I learned that even if we are university or high school students, there are many things we can do in our daily life.　Moreover he told us that we shouldn't necessarily determine our occupations in a hurry and that we should search constantly for career opportunities. Doing well on exams does not mean doing well on research and so as to become good physics researchers, we should study both theory and experiments. I think that we also should learn about studies in different fields from ours. I will try to put these lessons into practice from now on.

This was my first opportunity to introduce my research in English. The more I tried to express my passion for my research, the more seriously the Ph.D. students listened to me and more deeply they communicated with me. This research presentation meant not only sharing my work with others but also receiving feedback and considering how to develop my research. Although I was very nervous, I truly enjoyed the experience.

I have learned to speak English and be proud of my English ability through the whole program including GSO. I believe that in order to do acquire foreign languages, we have to learn and use them. By acquiring foreign languages, we can broaden our knowledge much better. In particular, having communicated equally with foreign researchers in a non-native language gave me great confidence. As a result of this experience, I have come to take part in international research activities, using global languages such as English, overcoming national barriers.

The excellent research environment at OIST was the most amazing aspect of this Science camp as a future researcher. I felt ashamed that I had not known such a great research organization existed in Japan. I also realized, in connection with the lesson I learned from the lecturer, that in order to work in an environment where I can investigate what I really want to do in the future, I must make enormous enough efforts to show my worth and constantly explore future opportunities.

Furthermore, the lecture on quantum cryptography technology broadened my perspective. Although the topic was closely related to my current research interests in the future, I was surprised by how it relates with various fields and the ways it's approached from more engineering and practical perspectives. At the same time, I became increasingly interested in quantum computing research. It was a moment when I was attracted to a new interesting field which I had never considered before. The passionate attitude of the researchers toward their work has now become one of my future aspirations and I would like to work with such great colleagues. Through this experience, I was able to improve my ''vision'' and ''research mind''.

I will make full use of these experiences in my future and continue to try doing many things without forgetting the attitude of constantly improving myself.
Finally, I would like to express my appreciation to all of the people who were involved in and helped us for GSO and Okinawa science camp.

My English Trip to Okinawa

Miku KISHIMOTO

To begin with, I'll give my feedback about GSO. I am fond of English and study hard for a long time but when I use English in actual situations, I found that I have a difficulty with talking, and that I can't say what I think as I please in English. But on the contrary, I realized that I can say what I want to convey in easy expressions, exchanging some words that I myself understand well, too. And I now have confidence that my English skills have improved through my previous English studies and GSO.

Secondly, I'll look back at my science camp in Okinawa. On the first day, I came in touch with the cultures in Okinawa which are quite different from that of my hometown and have a somewhat foreign feel to it. The fact that the coastline on the east and west sides of the main island is completely different was very impressive. The West side is for tourism and the East side is for industries in Okinawa, so 63% of the coast there is non-natural. Although there is a situation like this, Okinawa has a high diversity of lobster and the extinction rate of them is increasing now due to the development of the coastline. I learned that we should protect them and think about ways to conserve the species around Okinawa island. Related to this, I thought that it is good for Okinawa to make a pact to enact limits on coastal development. On the second day of our visit to Okinawa, I went to OIST which is a graduate school attracting researchers from around the world. OIST was a dreamy place for me. It was a great institution that gave researchers the best tools to devote themselves to their research, and the wide range of ages, disciplines, and ethnicities allowed them to gain a variety of insights, perspectives, and points of view. I thought about how fun it would be to do research with people from overseas there. I also felt that I was able to broaden my own perspective for the future. I learned about Neuroscience from Esteban who had worked as a doctor in Mexico. He said that regeneration is really slow and the axons stretch caused by accidents or something like it makes the neuron degenerate for 3 days or more, and then it starts regenerating after 3 days or more. He is studying the regeneration of neuronal damage caused by sudden accidents, and he is doing this research under various conditions, such as how long the shock duration was, etc. This was a very interesting talk that I found very

informative. I have a dream that I'd like to engage in medical treatment in the future and I thought it was a golden opportunity to talk about medical care and the way to think about it with a doctor from abroad, so I gathered up my courage and asked if there was any difference between the medical systems in other countries and those in Japan. Then Esteban and the staff of OIST told me that in Europe, which is famous for its infrastructure, all patients have a private medical room for each person regardless of the wealth of the patient. In Mexico, as in Japan, apparently group wards are generally common. Also, in Europe and Mexico patients are told the method of treatment in great detail, but they pointed out that Japanese patients have a lot of questions about their own body because they aren't taught it as well as Europeans and Mexicans. For myself, It is good for me to hear the foreigners' precious opinion against the systems of medical treatment in Japan, and I thought that I would like to think more deeply about such events in the future. On the third day, I learned about quantum computers from Shin Sun. I was impressed the most with the way sunglasses protect against sunshine or something like it, using the direction of photons and directions of filters. Also I learned about a protocol which detects eavesdrop by sending some keys. The research was really interesting, and I thought to myself that I would like to spend the next year in a class called "information" to master it. I was impressed that Mr. Shin seemed to be enjoying himself so much, and I thought it was amazing to be able to encounter something so enjoyable over the course of his life, and I decided to study hard and grab hold of my dream in order to encounter something like that.

The report on Okinawa Science Camp and GSO

Hiromu YAMAMOTO

1. What I Improved by GSO

I was able to improve many parts of my English skills. For example, when I talked with ALT, It was hard for me to understand what they really want to say because the English I normally use for studying is clear, natural and easy to understand, but when speaking face-to-face, ALTs tend to use idiosyncratic, dialect-like expressions and speak very quickly. Little by little, I got used to it and was able to predict what the other person wanted to say and respond instantly. I am good at speaking or responding to improvisation, then, I was also able to improve my impromptu skills in English.

Moreover, I realized how difficult it is to explain English words in English. At first, I could only say similar words but the more I faced that situation, the more I was able to explain using longer sentences or speaking with concrete examples.

I also learned new words and was able to express my opinions, which was a valuable experience. Thank you very much.

2. What I felt / experienced / leaned in 4 days of Okinawa Events

First, I felt that many elements were needed to solve the coral reef problem, the bleaching phenomenon. I was especially surprised to learn that typhoons are needed to prevent coral from bleaching. I found it very interesting that Okinawa is geographically prone to typhoons, which is a nuisance for the people living there.

Second, I found the lectures in English very difficult. There was a lot of technical terminology, and I had to translate as quickly as possible, so there was a lot to do in a short space of time. On top of that, the lecturer's English speaking speed was merciless. It required a lot of thinking. I felt as if I was studying abroad, and I think I got to know a little bit about

both the difficulties and the joys of being an international student.

Third, at the poster presentation session, I was a little nervous because it had been a while since I last presented my research in English, but I really enjoyed the time. I had a hard time making sure that my message was conveyed, but the OIST students listened carefully, and I was able to receive questions and advice from a different perspective that I would not have been able to get at high school, which helped me improve my presentation skills even in that short time.

Also, through question and answer sessions with other students, I discovered ways of thinking that I didn't have and things I could relate to, and I was able to ask questions in English. I felt like all the hard work and preparation had paid off.

Fourth, at the museum in Yambaru, I looked at the actual materials and timelines and thought about what kind of history Okinawa (Ryukyu) has and what we can do in the future by learning from it. I was impressed by the misery of the war, the way it became American property and was later returned to Japan, and the efforts and ability of the people at the time to respond to the complexities of the region. I want to do what I can and make use of this experience in the future.

3. Future Vision

I learned and acquired the above-mentioned things mainly through this big event. I want to be active globally in the future (at least in a job using English), so I was able to gain a lot of experience. There were some parts of the humanities course that were difficult to understand, but I will treasure what I did understand and use my presentation skills to work for people, not just for the exams.

Okinawa Science Camp Report

Maho TOKIYAMA

I joined the Okinawa Science Camp March 11 to 14. I was most impressed with Prof. Reimer's lecture at the Okinawa Science Camp. Professor James Davis Reimer studies coral reef life at the University of the Ryukyus. I had heard about the natural environment of Okinawa in GSO, but I was surprised at the number of species that the coral reef held by observing real rubbles. Diversity in the sea is maintained by coral rubbles. It has much more animals than we expected. Thanks to this experience, I understood the importance of the environmental research talk that followed and I became more interested in the content of the lecture. Considering the number of species, threats, and rare and unique animals, Okinawa can be said to be an important environment.

Also, unlike Okayama, Okinawa has a warmer climate and different vegetation. Alpinia zerumbet, a plant that prefers warmer climates, is native only from Okinawa to southern Kyushu. It is not commonly known in Okayama, but a restaurant in Okinawa had it kneaded into the soba dishes. It was interesting to directly feel the influence of vegetation on food culture.

We spent two days at Okinawa Institute of Science and Technology (OIST). OIST has some international scientists. Scientists at OIST are working hard with support from the Japanese government. 60 of about 300 students in OIST are Japanese, but the others are foreign people. Hence, the menu at the cafe in OIST was largely foreign food.

We were told by scientists about their research at OIST. One, who had been a doctor abroad before joining OIST, was studying neuron regeneration. The other was studying quantum cryptography. Quantum computers are the best computers available today, but quantum cryptography can create codes that even quantum computers cannot solve. He said it took several years to understand the nature of quantum, which surprised me. Their lectures were difficult to understand, so I managed to listen to them with the help of my friends and teachers.

We had an opportunity to tell the OIST people about our research at iP. I was nervous to

give a presentation in English, but I got advice and was able to further develop my research.

What I was most looking forward to during Okinawa Science Camp was observing mangroves, but I was shocked because it was suddenly cancelled due to lightning. However, we were able to see a replica of the Yambaru ecosystem and lives of people living in Okinawa in the past at the museum that we visited instead. Although some species have been decimated by invasive alien species such as mongooses, the extermination of invasive alien species and the protection of native species are being actively pursued and the unique ecosystem of Yambaru is being preserved. When we travel, it is important to know the efforts being made in the area.

Okinawa is home to many plants and animals, but not all of the creatures that live in Okinawa should be protected. Purple Okinawan sweet potato is a specialty of Okinawa, but it is forbidden to take unprocessed sweet potatoes out of Okinawa. That is to prevent insects that harm sweet potatoes from attaching to the purple Okinawan sweet potatoes. In addition to these, there are other crops that require inspection or are forbidden to be taken out of Okinawa.

I am not good at English, but through the Okinawa Science Camp and GSO, I became less afraid of English than before and I think that my perspective has been expanded. When I go to college, I would like to use these experiences to challenge myself to do things that interest me.

Island Lesson: 4 Days in Okinawa

Yoshi TERUI

Through the 4-day Okinawa training, I believe I developed a positive attitude of actively trying to understand and achieve things I didn't know or couldn't do by doing my best. I find English very challenging, and that feeling didn't go away during the Okinawa training, and there were many moments when I felt inferior to others. However, if it were the old me, I would have probably given up thinking, "I won't be able to understand this anyway," but I was inspired by the attitude of my friends, the students from the University of the Ryukyus, and the OIST staff, who all tried to understand things they didn't know. Before I knew it, I wanted to understand as much as I could, and I was able to research and ask questions about the things I didn't understand. Realizing that, depending on my effort, I can steadily overcome challenges that once seemed out of reach and enjoy the process was something I felt was more valuable than the various knowledge I gained through this training.

In the lecture on the first day by Prof. Reimer, I learned that Okinawa is home to a very diverse range of species, and the diversity of microorganisms is maintained thanks to the coral rubble. During the activity of finding microorganisms, I actively searched for microorganisms, communicated with students, and was able to directly ask Prof. Reimer about copepods, a type of zooplankton. This experience on the first day significantly lowered the barrier for speaking English and asking questions, and by observing everyone's proactive attitude, I was able to boost my own motivation.

In the lecture by Esteban, a student at OIST, on axonal injury, he taught us the methods for culturing neurons, the experimental procedures for axonal injury, and how after an axon is stretched, there is a period of degeneration followed by a period of regeneration. Later, when we toured the laboratory, I asked why the axons are stretched diagonally, and he explained that stretching them diagonally helps reduce the damage to the axon during separation, making it easier for the axon to regenerate. In this case, I was able to achieve my goal of asking a question, and although I didn't fully understand everything in the lecture, it was still an incredibly satisfying learning experience.

In the lecture on quantum cryptography by Shin Sun, another student, I didn't know anything about quantum cryptography at first. So, I had researched it in Japanese the day before and came to the lecture with a basic understanding. Although I still struggled with difficult English terms, I was able to understand more than half of the content, thanks to the

diagrams and clear explanations.　On the third day, I was able to teach the students around me for the first time that this is what I think it means, which gave me a very big confidence boost. The lecture was particularly specialized, and included such topics as quantum cryptography, which uses polarized photons, a substance that actively changes photons, to completely prevent eavesdropping on information, and how to obtain information by solving a key based on a base.

These three lectures not only provided specialized and fascinating knowledge but also taught me the joy of understanding things I didn't know, the experience of speaking up without fear, and the awareness of working together with others to achieve a common goal instead of struggling alone—lessons that are important for my future life.

As I have mentioned before, I believe that through this training, I gained not only English skills but also a positive attitude toward learning and facing the unknown, as well as the ability to challenge myself. I am confident that this will contribute to improving my English, preparing for exams, and my university life in the future. I have spent over six months, including the pre-training period, confronting my own English skills, but thanks to this training, English, which I once saw as something I simply struggled with, has transformed into something I find enjoyable and even like, despite still being challenging. My fear of making mistakes has significantly diminished. The change in my mindset became most evident when I presented my IP research in front of OIST students. While I felt nervous about being asked questions, I was, in some way, also happy about it. This is something I could never have imagined before, and I see it as a very positive change and significant growth.

I believe the experiences from the Okinawa training will be a great source of support for me in the future. This is because I took this training seriously and made a genuine effort to understand. If there are any similar opportunities in the future, I would definitely like to take on the challenge, and I hope others will not be afraid to challenge themselves as well.

I am truly glad that I was able to spend such an amazing, happy, and meaningful four days.

What I Gained through Okinawa Science Camp

Yu MIZUNO

What Impressed Me the Most

One of the most impressive aspects of this camp was the opportunity to engage with researchers and scientists at the Okinawa Institute of Science and Technology (OIST). Their passion for their fields and their willingness to share their knowledge with us left a deep impression on me. I was particularly inspired by how they approach complex scientific problems with curiosity and determination. The research facilities at OIST also amazed me, as they demonstrated the vast potential of scientific advancements. I was especially impressed by Esteben, who is a researcher of neuroscience. He got his medical license in Mexico, his homeland, and he came to Okinawa after an internship, volunteering, and working at ICU and Emergency services in various countries. I want to be a researcher with a medical license, too. So, his background and research was very helpful. Another memorable moment was interacting with fellow participants. Each of them came from different backgrounds, yet they were all united by their curiosity for science. The discussions we had, whether in the labs or during lessons, broadened my perspectives and allowed me to see scientific challenges from multiple viewpoints.

What I Have Learned

Throughout the program, I was exposed to a wide range of scientific fields, including molecular biology, marine science, and neuroscience. One of the most surprising things I learned was that even neuroscience—a field that seems very closely related to medicine—was described as interdisciplinary. I had always thought of neuroscience as a highly specialized field, but I was surprised to see how it connects with many other areas of science. This made me realize again how important it is to learn about different subjects instead of focusing too much on just one.

Beyond scientific knowledge, I also learned how to communicate my ideas more effectively. Presenting my research and receiving feedback from professionals taught me how to

structure my thoughts logically and express them clearly. This skill will be invaluable in my future academic and professional endeavors.

How I Have Grown Up

Before attending the camp, I often hesitated to ask questions or express my opinions in discussions. However, being in an environment where curiosity was encouraged helped me overcome this hesitation. I realized that asking questions is not a sign of ignorance but a sign of a desire to learn more.

What I Have Realized About Myself

One major realization I had during this camp was that I enjoy hands-on scientific research more than I had expected. Conducting experiments, analyzing data, and discussing results gave me a sense of excitement and fulfillment. I now understand that I want to pursue a future where I can continue engaging in research and problem-solving.
I also realized that I have a strong passion for environmental science. Observing the natural beauty of Okinawa and learning about its ecosystems made me appreciate the importance of protecting our environment. This has strengthened my determination to contribute to sustainability efforts in the future.

What I Have Achieved

One of my biggest achievements during this program was successfully presenting my research on Euglenas. Though I was nervous at first, I managed to convey my ideas clearly. The feedback I received from scientists and peers helped me refine my understanding and presentation skills. Additionally, I built valuable connections with both students and professionals. These connections will continue to inspire and support me in my scientific journey.

My Future Vision

After this camp, my determination to pursue a career in scientific research has grown even stronger. I want to contribute to solving global challenges, especially in the fields of environmental science and biotechnology. I also hope to inspire other students to develop a love for science, just as I was inspired by the researchers at OIST.

One of my goals is to participate in more international research programs and collaborate with scientists from around the world. I believe that science knows no borders, and working together across cultures is essential for innovation and progress.

Messages to Other Students

To those considering joining similar programs, I highly encourage you to take the opportunity! This camp was not just about learning scientific facts; it was about experiencing the process of discovery, meeting inspiring people, and realizing our own potential.

I realized the importance of never being afraid to ask questions, to step out of your comfort zone, and to challenge yourself. I think Science is not just for the most intelligent or the most experienced—it is for those who are curious and passionate about understanding the world around them.

Conclusion

The GSO and Okinawa Science Camp was an unforgettable experience that has shaped my perspective on science and my future visions. I am deeply grateful to Ms. Martina, Mr. Tsuda, Mr. Ninomiya and all the teachers and researchers who guided us throughout this camp. I will carry the lessons and inspiration I gained from this camp into my future studies and beyond.I look forward to applying what I have learned and continuing to grow as a scientist and a person.

Interesting GSO

Sae FUJII

I gained a lot of learning and experience in GSO and Okinawa Science Camp.

First of all, I would like to talk about GSO, where we had to speak only in English with English specialists. It was difficult for me to speak only in English. There were many times when I didn't know what to say or couldn't continue the conversation because I couldn't find the words I wanted to say. But each time, the teachers tried to understand what I wanted to say and we were able to have a good conversation. Because of this, I think I grew up with more courage to speak English than before. During the last lesson, each teacher gave a speech in support of their students. Their heartfelt messages gave me love and courage. And they made me feel that I was going to Okinawa for training.

I encountered many interesting things during my stay in Okinawa that broadened my perspective.

One of the things that impressed me was that 63% of Okinawa's coastline is artificial. I learned this from Prof. Reimer's lecture on the first day in the University of the Ryukyus. I had a preconceived notion that Okinawa has a rich natural environment, so I was surprised to learn that more than half of the beaches are artificial. I also learned that coral cannot survive well on artificial beaches and that coexistence with urban development is also a problem. We also did other activities in Prof. Reimer's lecture. We had to use the microscope at the University of the Ryukyus to see what creatures the professors had taken from the dive. I was physically exhausted after using the microscope for about half an hour, but I heard that researchers keep doing this all the time. I was disgusted just imagining it.

Another thing that impressed me was the learning environment at OIST. OIST is the Okinawa Institute of Science and Technology Graduate University, where outstanding researchers from all over the world work on their research every day. We learned about the quality of the learning environment at OIST during our training. Tuition is practically free

for students, and living expenses are almost zero if you live in the dormitories. This means that students do not have to earn their own money, and they can devote themselves to their research. When I heard about this, I thought, "What a great system. It is a great benefit for students not to have to worry about money. However, this wonderful system of OIST is not well known. I was really disappointed about this. So I hope more people will know about it.

We met many students and staff at OIST. Two students gave us lectures, and on the third day, I presented my research on the Izayoi Project. It was a difficult presentation, including preparation, and I was not able to answer questions well on the day of the event. However, the students kindly watched over me and I was able to complete the presentation.

I had two goals for these four days: to speak to the teachers myself, and to eat a lot of local food. I was very happy when my English was understood even though I was not fluent. I was also able to eat local food at the hotel. I especially liked the *irichi* and *tebichi*. I had many second helpings of *irichi*, which is a dish of finely chopped ingredients stir-fried in a broth. The *tebichi* is a dish of stewed pig's feet, and it took courage to eat it. It was very soft and juicy when I actually tried it. I heard that it is rich in collagen and good for the skin. Therefore, I was satisfied that I was able to achieve both of my goals.

This program was hard work but a lot of fun. If the program is held again next year, I hope many students will apply.

As for my future dream, I would like to visit Okinawa again and experience Okinawan culture. I also want to improve my English skills so that I can speak English with confidence. Finally, I would like to express my gratitude to all the people involved in this training program. Thank you very much.

Report on Okinawa Science Camp

Karin MAKITA

After six months of preparation, the Okinawa Science Camp was completed.
I learned a lot of things through this program.

First, it's important to look at the audience's face during my presentation. If I did a presentation, looking at my script the whole time, I wouldn't be able to see their reactions. Thus, I presented it with that in mind. As a result, I could know what point I should explain in detail because I was able to notice that the audience couldn't understand my research. For example, they frowned, inclined their head to the side, and so on.

Second, it's important to ask what I couldn't understand about the contents and words which others said. I was able to answer the audience's questions more clearly because I asked about what I couldn't understand. Doing questions leads to a good presentation because conversation increases. Also, I found that many of the OIST students' questions were a request for my opinion. It was interesting that they hardly asked me about the contents of my research.

Next, I'll talk about my growth. My listening and speaking skills improved. Before I went to the Okinawa Science Camp, I practiced dictation and talking with foreigners many times. After it started, I tried to ask questions about OIST students' lectures. Thus, I managed to understand the contents. Thanks to that awareness, I was able to understand and ask some questions. However, there were many situations where I didn't know how to ask in English. So I realized that was a weakness of me. Moreover, before I participated in this program, I was not good at speaking in public. But I could gain confidence through the experience of my presentation. I spent a lot of time practicing it. Therefore, my resistance to presenting in English was removed. I rather enjoyed it because it gave me a sense of accomplishment.

Next, what impressed me the most. It was OIST's system, and features. I was surprised that OIST students don't have to pay tuition fees at all. Moreover, OIST doesn't have

departments. Thanks to that system, students can research more flexibly and actively. Also, there are a lot of whiteboards everywhere in OIST.　I heard students of OIST even write things they come up with, windows. It helps them to organize their thoughts. Thus, I decided to write my thoughts on my memo pad in order to have good opinions.

Next, what I have learned through lectures. First, the ocean of Okinawa is one of the most ecologically threatened cities in the world. So we have to protect the ecosystem in coral reefs. In order to do that, they require typhoons because typhoons mix high water temperature at the sea surface and low water temperature in the deep sea. It maintains a proper temperature. I was surprised because I thought typhoons would attack coral reefs. It was interesting like a paradox.

Also, I learned about stretched neurons and quantum internet. However, I could hardly understand that content, but it was interesting when I was able to understand a little through the announcers' easy to understand explanations and consultation with friends.

I prepared very hard for this project. I experienced a lot of things such as talking with foreigners, going to OIST, and giving presentations in English. I could improve not only English skills but also communication skills.　I learned the joy of communicating in English. Thus, if I have opportunities to do it, I would like to join it whether they are held at school or not.

I think this science camp has succeeded with the support and cooperation of so many people. I will never forget this fact and will continue to study hard.

Okinawa Training Trip Report

Mona SANEHIRA

I went on a four-day training trip to Okinawa.

On the first day, we visited the University of the Ryukyus and attended a lecture by Professor Reimer. I learned about coastal development in Okinawa. In Okinawa, the environment differs by region and is mainly divided into jungle, tourism, and industry. Because of this, coastal development also differs in each area. The ocean in Okinawa is rich in biodiversity, so it is one of the most important seas to protect. The professor also taught us about coral bleaching. The main cause of bleaching is the rise in seawater temperature. Coral bleaching is also related to the tetrapods placed along the coast. Tetrapods can change ocean currents, which can affect water temperature and quality, leading to coral bleaching. One surprising fact was that typhoons can help prevent coral bleaching because they lower water temperatures. After the lecture, we observed living organisms from bleached coral under a microscope. Even in a small piece of coral, there were many different kinds of creatures, all of which were very interesting. We also learned that DNA can be used to identify organisms without needing a microscope, and I was impressed by this advanced technology. After leaving the university, we visited Zakimi Castle Ruins, a UNESCO World Heritage site. The ruins were very dynamic, and the view was amazing.

On the second day, we visited OIST (Okinawa Institute of Science and Technology) and attended a lecture by Esteban, a Ph.D. student. Before joining OIST, he was a doctor. However, he decided to study at OIST to help advance medicine. He is researching neuroscience. His experiment focused on regenerating axons, which are parts of neurons, after they are stretched and damaged.

When I entered his lab, I saw many advanced machines and got a glimpse of his research process. His research was quite complex and difficult for me to fully understand, but I realized that thanks to researchers like Esteban, medicine continues to advance. I felt a deep sense of respect for him.

On the third day, we held a poster session for our own research projects. Although I had practiced, I was very nervous about explaining my research in English to OIST students. However, after receiving feedback from them, I felt much more confident during my second presentation. I was also able to manage to answer their questions.

In the afternoon, we attended a lecture by Shin. First, we conducted an experiment using filters to observe how light passes through, depending on the direction of the photons. When two filters were placed perpendicular to each other, no light passed through, making it impossible to see through them. However, when we added th third filter at an angle in between, some light passed through. I found this very interesting. This principle is used in everyday items like sunglasses.

He also taught us about cryptography. I learned that information can be transferred between two people if their bases match. I was surprised to learn that this principle can also be used to detect wiretaps.

My Thoughts and Reflections

Through these three lectures, I was worried about whether I could understand the content since I am in the humanities field. However, I listened carefully, discussed with my friends when I had trouble understanding, and did my best to keep up. Of course, there were parts I couldn't fully understand, but by staying engaged, I was able to make the most of the lectures.

The most impressive thing for me was the research environment at OIST. There were many cutting-edge machines, and students received a lot of financial support, allowing them to focus entirely on their research. The students came from many different countries, and during breaks, people of different nationalities, ages, and genders were talking with each other. This made me want more people to know about OIST.

Through this training, I learned the importance of being curious about different topics. I also realized that if I don't take action, I won't gain anything. Before, I wasn't very interested in chemistry, but the more I learned, the more interested I became. Having all the lectures in English also motivated me. Everything was a new and valuable experience, and I enjoyed it a lot.

This experience made me strongly want to improve inconvenient things in the world. I also realized that I can expand my own possibilities, which gave me confidence.

Finally, I want to thank all the teachers involved in this training. I was able to improve not only my English skills but also grow in many ways. Thank you very much.

Report on Okinawa Science Camp

Kazuki HAMADA

There are four things that I felt and learned through Okinawa Science Camp.

First, I learned coral reefs are very important to protect sea animals. That was told to me by Professor Reimer on the first day of Okinawa Science camp. According to his lecture, Okinawa has the largest number of species, rare species and unique species in the sea. Coral reefs protect their animals as their home, and the coast as a dike from waves. However, red soil, coastal development, and more events caused by humans have bad effects on the coral reefs. So, we should pay attention to our behavior. Some say the coral reef issue only concerns Okinawa. But It's wrong. I think I can say it in other similar situations. So, I thought we should spend our days thinking about the environment, not thinking it's none of our business.

Second, Esteban's Career Talk. Esteban is an OIST's Doctoral Student. According to his talk, he was a medical student and participated in as many internships and volunteer activities as he could to become a doctor. During one of his volunteer activities he met a patient with a spinal cord injury. That deeply affected him and led him to become a neurologist. This story made me realize the importance of having a variety of experiences, including internships and volunteer work. I also found his decision to go from being a doctor to a researcher to be very difficult and something to admire.

Third, Shin's lecture on the third day. Shin is an OIST's Doctoral Student. I was most impressed and interested in it. He talked about cryptography and information security in quantum computers. He taught us using materials and we could ask him questions anytime. So, his lecture was easy to understand. According to his lecture, Quantum can exist in a superposition state. So for example, when you send an email to a friend, someone else snooping on it will change the quantum form, thus preventing eavesdropping. Quantum mechanics is something that cannot be expressed in terms of physics as we know it, so I found his lecture very interesting and intriguing. Also, after his talk, we saw the

supercomputer at OIST and his lab. The supercomputer surprised me because it was much larger and more powerful than I had imagined. And the lab was very active and it was a great experience to get a feel for the university.

Fourth, presenting our research to OIST students. I learned something through it. I gave a presentation with one of the friends I researched with. His English was better than mine. So I depended on him for more than half of the presentation. I regret that. However, I think that the presentation was a very important and useful experience, because I improved my talking and listening skills in it. And I understand many points I should change in my presentation and research by OIST students. So I hope to grow more from this experience.

I learned many things through the training in Okinawa, and I think it was a very meaningful experience for me. I also think that my English skills have improved to the extent that I can see it in myself. Therefore, I believe that I have achieved my original reason for participating in this training program, which was to improve my English skills. However, through the training in Okinawa, I realized how immature I am, so I hope to use this experience as motivation to work harder in English and become better at it.

Curiosity to Confidence

Riko FUKUDA

Through this training program, I did not acquire any special skills, but I gained something even more valuable—confidence in speaking English and expressing my thoughts. More importantly, I realized that I, too, might have the potential to contribute to making the world a better place.

One of the most memorable experiences was attending a lecture by James Reimer, a professor I had previously only seen on screen during GSO activities. Meeting him in person, I was struck by his engaging presence—he maintained eye contact while speaking and created a warm, welcoming atmosphere. Another unforgettable moment was observing organisms around rubble under a microscope. I was surprised at how immersed I became in the process, realizing a newfound curiosity for marine life. Dr.Fabian's lecture also left a deep impression on me. It reminded me of a childhood memory when my mother, who loved collecting seashells, once showed me a white stick-like object and told me it was coral. Back then, I only thought it was beautiful. However, through this lecture, I understood that it was actually bleached coral, and I felt a sense of connection between my past and my present learning.

Another memory that surfaced during this program was from summer camp when I was 12. On the final day, we participated in a beach cleanup, where I saw trash scattered across the shore and even birds that had died from being trapped in it. That shocking sight has stayed with me. Over the years, whenever I learned about environmental issues in school, I recalled that beach. Listening to Professor James' lecture, I once again realized that while coastal development may be beneficial from an economic perspective, it poses significant threats to marine ecosystems. This made me think about the importance of increasing our knowledge and awareness of environmental issues. Learning that Okinawa is home to an incredible diversity of species further deepened my interest in the subject.

My experience at OIST was truly inspiring and will remain with me for years to come. As soon as I stepped into the campus, I felt as if I had entered a different country. The futuristic architecture and the presence of researchers from all over the world amazed me. On the first day, Esteban gave a career talk and introduced his research on neurons. Although the topic was highly advanced, his clear explanations helped me follow along, and I

found myself deeply engaged despite it being a scientific subject. During the campus tour, I was fascinated to learn that OIST's buildings were designed with curved structures and natural colors to blend with the surrounding landscape. This was a requirement set by Onna Village to protect its rich biodiversity, highlighting the balance between scientific progress and environmental preservation.

On the second day, I gave a research presentation. Unlike when I had presented at my school with teammates, I had to do it alone, which made me extremely nervous. However, I had carefully revised my script and practiced based on the feedback I had received earlier. While my first attempt was not as strong as I had hoped due to nerves, I was able to reflect on my preparation and improve significantly in my second attempt. It was incredibly encouraging to see graduate students, despite working on cutting-edge research, showing genuine interest in my presentation and offering thoughtful advice.

Later that day, we attended a lecture on Quantum physics by Shin Sun. At first, I felt completely lost, unable even to formulate questions. It was frustrating, but thanks to Shin's demonstration and explanation from science students of our school, I gradually grasped some key concepts. This experience taught me the importance of seeking help and learning from others when faced with challenging topics.

At the end of our time at OIST, one of the staff members told us, ''Cherish your learning in science—and in the humanities as well.'' This comment struck me, making me realize that I had unconsciously limited myself by thinking in terms of the traditional divide between the sciences and humanities. At both The University of the Ryukyus and OIST, I met researchers who were passionate about improving society, not only through their hard work but also through the joy they found in their research. Their dedication was truly inspiring, and it made me aspire to find a field where I can contribute to others while pursuing my own passions.

Through this program, I gained not only new knowledge but also the motivation to continue learning. I was deeply influenced by the people I met, including my fellow participants, whose enthusiasm and proactive attitudes inspired me. I will carry these lessons forward and apply them to my future endeavors.